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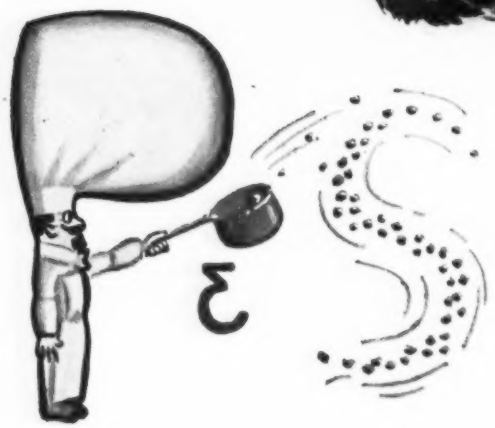

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FOOD MANUFACTURE

Vol. XXVIII, No. 5 May 1, 1953

Factory Hygiene

THE new Public Health (Infectious Diseases) Regulations, 1953, are, in general substance and form, similar to those of 1927 which they supersede, although the provisions concerning action to be taken by local authorities and Medical Officers of Health against the risk of food poisoning, which applied under the old regulations to "enteric fever and dysentery," now apply to "typhoid fever, paratyphoid fever, or other salmonella infections, dysentery, and staphylococcal infection likely to cause food poisoning."

Under the 1927 regulations, the steps prescribed could only be taken in relation to a person suffering from the disease in question, and for the purpose of preventing such a person from continuing to work in an occupation connected with the preparation and handling of food or drink. The new regulations go further. They provide for action to be taken not only as regards a person suffering from the disease in question, but also one shown to be a carrier of the disease. A person in either class may now be prevented not only from continuing to work in an occupation connected with food or drink, but also from entering such an occupation.

Again under the 1927 regulations, the prescribed steps could not be taken until the Medical Officer of Health had reported the case concerned to the local authority. In the new regulations, while the same general principle is maintained (because action may involve the local authority in paying compensation under Section 278 (1) of the Public Health Act, 1936), there is provision to enable a local authority to give its Medical Officer of Health such authorisation as will permit him to take the prescribed action in a particular case without waiting to report it—although he is required to report it at the earliest opportunity—if in his judgment this action needs to be taken as a matter of immediate urgency to prevent the spread of infection.

Writing in the *Municipal Journal* (No. 3120, 1952), Dr. Greenwood Wilson expresses the opinion that Section 278 (1) of the Public Health Act, which provides for compensation, is probably the principal factor in restraining Medical Officers of Health from fully exercising their powers under the Public Health Regulations. There are some who may be inclined to doubt whether the Medical Officer of Health should find it necessary to come into the picture, except to confirm a suspicion of the state of the worker's health.

An American view of the subject of routine medical examination of food handlers is given by Dr. Ernest L. Stebbins, director of the Johns Hopkins School of Hygiene and Public Health at Baltimore. His case, in substance, is that past experience has shown that physical examinations are not a practicable procedure and that it is not wise to impose them by law. Among the reasons given is that examination of the food handler can only give information as to his status at the time of such examination. Another compelling reason for opposing such requirements is the great expense incurred in the diagnosis of infectious disease, involving extensive examination and laboratory procedure to detect many of the diseases that might conceivably be transmitted.

After years of experience in the analysis of these results, it is shown that the approximate cost of detecting one possible typhoid carrier of that type is 50,000 dollars. With the decreasing frequency of typhoid carriers, this figure will undoubtedly be increased. Further, it has been clearly demonstrated that the requirement of stool examinations do not detect with any accuracy the typhoid carriers that are involved in food handling.

Dr. Stebbins urges an alternative "constructive educational approach" to the prevention of food-borne disease in three chief ways: (1) by the cooking and heating of food, (2) by proper refrigeration, and (3) by the education of food handlers in the essentials of personal hygiene and the sanitary cleansing and disinfecting of food utensils.

It is claimed that, as a result of this approach, for the last 20 years food-borne disease has been practically eliminated in Baltimore.

Much is being done in Great Britain to correct the lack of knowledge of public hygiene, which is responsible for more food poisoning cases than anything else although sheer carelessness is another potent factor; but the educative campaign needs intensification, and combined with reasonable medical collaboration, should reduce the somewhat alarming incidence of these cases.

Food and Transport Costs

HIGH transport costs are beginning to affect canneries and food plants located in the more isolated areas of Scotland, especially when coupled with the closure of many overseas markets which were taking large supplies of canned goods. Transport costs to the main British markets have risen steeply and are rising again under the impact of higher costs for coal. The position varies according to the type of food concerned; meat, for example, is still in demand and can bear additional transport costs, fish or canned goods cannot do so, owing to unfavourable consumer reaction. Frozen foods face the same problems, with the added one of storage costs.

This situation demands an urgent enquiry into transport costs with a view to achieving a minimum rate on food brought from distant areas. Eggs and bacon from Orkney provide yet another example of production which is threatened by the high cost of bringing the food to the consumer.

Crop Stimulation by Antibiotics

IT is already an established fact that trace additions of certain antibiotics to the diet of pigs and poultry will lead to significant increases in their rate of growth (FOOD MANUFACTURE, **27**, 2, 1952). Last autumn another discovery, similar in nature but different in its potentialities, has linked antibiotics with food production.

Simple experiments in the United States have shown that traces of some antibiotics can stimulate plant growth. In one test, two seed trays were sown with 49 sweet corn seeds each; growing and treatment conditions were identical except that the water fed to one tray contained five parts per million of terramycin. After four weeks the treated corn was much taller; also, 40 per cent. of the seeds receiving terramycin had germinated compared with 25 per cent. of the other seeds. Finally it was found that the weight of above-ground plant material for the treated crop was twice that of the control; this held good both for natural and for dry matter weight.

Similar evidence of growth stimulation has been secured in tests with sorrel, pansies, and radishes. For the last species of plant, penicillin was used.

Terramycin, however, seems to be the most favoured antibiotic in these initial investigations and not illogically perhaps, for it is derived from a mould originally found in soil.

Clearly such trifling quantities of antibiotic material do not directly feed plants. Their growth-stimulating effects must be indirectly produced. Some kind of biological catalysis seems probable. Is the plant's capacity to take up nutrients from the soil increased in the presence of antibiotics?

Much more research must be carried out. The facts themselves are so important that they must be widely confirmed, and their interpretation may prove to be a most difficult task. In a world whose population daily outgrows its food supply, the practical possibilities of this discovery are promising. One obvious hope is that in those parts of the world where the growing season is short, crops may be brought to maturity more quickly.

Exploration of the Sea

AN interesting *résumé* of the history of the International Council for the Exploration of the Sea was recently made by R. S. Wimpenny of the Fisheries Laboratory, Lowestoft (*Nature*, **170**, 4335, 906).

The period between the date of foundation of the Council and the outbreak of the first world war was one of well integrated international effort in the North Sea. This consisted of regular hydrographic, plankton, and trawling surveys of great descriptive value. The trawling work in particular resulted in a knowledge of the natural history of the plaice, to which little has been added since.

At a special meeting in 1948, subsequent to the drawing up of international conventions to regulate the sea fisheries, a special sub-committee was set up to deal with the comparative efficiency of fishing vessels, their gear, and parts of gear. A part of the programme involved under-water photography of trawls and seines and one of the most important features of the Council's jubilee meeting in 1952 was the display of two films, one of which showed the behaviour of trawls under water near Malta. The other showed the behaviour of plaice about to be caught in the mouth of a Danish seine net used by the Fisheries Research Section of the Scottish Home Department in the shallow water of the Moray Firth.

It is now quite clear that relaxations of fishing effort can be weighed and made equivalent, so that any proposals made by North Sea nations on the new Permanent Commission, designed to be set up as soon as the 1946 Convention is ratified, will be understood and transformable into the means of getting the same or a greater yield from the area with less effort.

Slowly in the period between the two world wars, there was evidence of the warming up of the waters of the Northern Hemisphere, one of its consequences being the establishment of our great cod fishery in the Barents Sea, which only dates from 1928. Since the second world war, the cod has spread and increased in Greenland waters so that, in the North-Western Committee of the Council, Dr. Paul Hansen has been able to report that this species now breeds in west Greenland waters and does not rely on recruitment from Iceland. It is in matters of this sort that the hydrographers of the Council are at present engaged.

Of special importance will be the possibility of obtaining information on winds, currents, and temperatures which will enable fishery biologists to obtain not only forecasts of good fish broods and their distribution, but also the long-term prospects of a fishery.

X-Rays for Cereals

X-RAYS are now being used to test cereal grain by the U.S. Food and Drug Administration and by some American food manufacturers as a result of investigations carried out at the Kansas State College. Earlier attempts to utilise X-rays had been unsuccessful because the usual type of ray so powerfully penetrates a kernel of wheat or rice that "pictures" of insects or insect damage cannot be obtained. This problem has been overcome by the use of soft or low voltage X-rays, the type employed to detect flaws in very thin sheets of metal. Living or dead insects inside grain kernels will readily be detected by soft X-rays; even holes made by insects that are no longer present can be detected.

The need for a simple means of spotting insect contamination in unmilled grain arose from intensive microscopic testing of finished cereal products. A considerable amount of insect contamination was found, and the bakeries concerned were ordered to improve their general standards of hygiene. When this was done, however, there was little change in the situation.

Suspicion fell upon the flour mills as the main source of insect contamination, but again the utmost attention to hygiene failed to reduce the incidence of this trouble. It was clear that the main source was the grain before it reached the mills; but microscopic methods of testing are much less effective for unground material. As a result the soft X-ray technique was developed.

Some cereal food manufacturers have installed soft X-ray machines already. It is reported that they quickly pay for their cost and upkeep. Regular examination of grain enables "insect-dirty" batches to be rejected and the cost of milling grain that would have produced poor or unsaleable flour is saved.

British Productivity Council

THE proposed plan of action of the British Productivity Council, whose purpose, according to the Chancellor of the Exchequer, the Rt. Hon. R. A. Butler, M.P., was second to none in its profound importance for the whole future of the nation, was outlined by Sir Norman Kipping at a recent conference.

The first step was the formation of the Circuit Scheme under which individual firms would be invited to enter a team comprising two men from management, two from the staff, and two from the workshops, which would be sent about once a month to visit one of the other teams in the same circuit. Any firm entering a team in this scheme would be free to decide whether it wished to be put into a circuit alongside competitors. Such a scheme would provide an opportunity for thousands of people, including those from the smaller firms, who normally did not get such a chance, to exchange ideas with other people under conditions that would not involve a loss of too much productive time.

In order to spread interest widely throughout the country, the Council would invite 105 towns to form a Productivity Committee, bearing that town's name, to act as the Council's "industrial partners." It was desired to leave a great deal of initiative and freedom to each of these committees to work out their own methods, but assistance would be forthcoming from the Council by the provision of suitable propaganda material and of lecturers and by the preparation of some specialist films. Financial assistance would also be made available to cover costs of meetings, the charges for publicising them, and the hiring of a hall or a projector.

It was evident that such work could not be done for nothing, and it was hoped that payment for the necessary staff could be made available from a Conditional Aid Fund.

Sir Norman was optimistic about the obtainment of from £30,000 to £40,000 a year for the project. He had consulted with the Government about it, they liked it, and the intention was that it would be carried out, but he had not yet got the bit of paper with the signature on it. In those circumstances he dared not say "will," although he did not think there could be much doubt about it.

A New Bee Problem?

THE systemic insecticides—highly toxic phosphorus compounds that are absorbed into plants to make them poisonous to all sucking insects—have been recognised as safe, when properly used, because the toxic material breaks down in the plant in six weeks or less. The final products of the break-down are harmless phosphates. That, at any rate, is the theory of modern systemic insecticides and it is well supported by experimental evidence.

A new development, reported recently in *Nature* (**171**, 263, 1953) seems most disturbing. It has been shown that a systemic insecticide of this kind can pass into the nectar of plant flowers. The crop treated was white mustard, and all flowers present during spraying were removed; thus the only flowers tested were those which opened from three to 12 days after applying the insecticide.

Other tests have shown that the systemic material is not broken down while in the honey stomach of

bees or even in honey itself during a period as long as 10 weeks. There seems no small risk, therefore, that toxic insecticidal material can be removed in nectar gathered by bees, but instead of breaking down harmlessly as in plants it will then remain toxic. It may kill the bee, of course, but if not it will be carried unchanged into the honey. This seems to be one of the problems that urgently requires the fullest investigation, for the use of toxic systemic insecticides is rapidly increasing.

Synthetic Amino Acids

IT is perhaps not realised how much progress is being made in the mass production of synthetic foods. Entirely synthetic amino acids are not vague ideas of tomorrow; two large American organisations have been producing methionine as a supplement to poultry feedingstuffs for some years, and a short time ago the huge Du Pont corporation opened a $4,000,000 plant for methionine synthesis. What is chicken feed today may possibly be human food tomorrow.

Two other amino acids that are frequently deficient in predominantly vegetable diets are tryptophan and lysine. Tryptophan can be produced synthetically, but present costs of production are prohibitive. Lysine synthesis is more promising as it can be made from furfural, a "chemurgic" product already obtained from agricultural wastes such as those from corn-cobs. A pilot scale plant for lysine synthesis is already in operation.

Diets that are poor in amino acid balance are common enough in the world. As populations rise, they may become more common still. With synthetic amino acid supplementation, however, such diets can be improved in their protein effectiveness by as much as 50 to 100 per cent. Where wheat is the basis of diet, lysine fortification will substantially increase nutritional efficiency. Where the staple food is rice, lysine and threonine will be needed. Corn-dominant diets require lysine and tryptophan; methionine, lysine, and tryptophan would all be wanted to make a root and legume vegetable diet reasonably effective.

It is therefore highly significant that lysine synthesis on a large scale is almost certain to follow the already established methionine synthesis. Nutritional developments that are at present confined to animal feeding can easily invade the field of human nutrition.

The problem of costs relating to amino acid synthesis is not insoluble. Synthesis is cheaper than extraction from natural sources, and the amounts required for fortifying poor diets are quite small, *e.g.* one pound or less of methionine is added to a ton of poultry feed.

Bacteriological Tests for Food Poisoning

ON the basis of recent studies, bacteriologists at the American Meat Institute Foundation have suggested that laboratory technicians examining foods for the presence of food-poisoning staphylococci should either use an anticoagulant other than citrate in the plasma employed for the coagulase test or should regard with suspicion any culture that requires more than three hours to clot citrated plasma (*J. Bact.*, **64**, 3, 1952).

Some time ago, effective laboratory procedure was developed for distinguishing between enterotoxin-producing and non-enterotoxin-producing types of staphylococcus bacteria in examining food for the presence of the food-poisoning varieties. The procedure was based on the ability of the enterotoxin producers to coagulate anticoagulant-treated rabbit plasma, and this coagulase test is being used in many laboratories.

More recent studies have shown that some strains of streptococcus that are capable of fermenting citrate are able to clot citrated rabbit plasma during a time period of from three to 24 hours.

Spring Song

FOOD and the times we sing. Flow sweetly pen,
To chronicle a list for celebration
Of fetters freed to speed this festive year:
Wooltonian fortitude's slow vindication.

We sing the egg unallocated, boiled,
With bread-and-butter snowy white again;
What bliss to bid the baker do our will,
And unabashed cajole the neighbour's hen!

We sing the sizzling sausage decontrolled,
The housewife's stand-by, schoolboy's favourite grub,
The deb.'s nocturnal breakfast, cabby's stay,
Comedian's comfort, stalwart of the club.

We sing the friendly fumes of strong black tea
(One for the pot once more—ah, homely treat!)
Bananas without queueing; and the thrill
Of rediscovering every kind of sweet.

We sing official sanction to make merry
And call back yesterday with roasted ox,
Stop junior's questions with a sticky bribe,
A-wooing go with giant be-ribboned box.

We sing the advent of the strawberry season
(Ducal and woodland) and—the gourmet's dream—
The berry's long-desired, delicious partner,
Lashings of luscious non-synthetic cream.

A Plymouth Food Factory

The name Beechwood applied to canned foods and table delicacies is a household one throughout the counties of Devon and Cornwall, and is well known in many other parts of Great Britain, as well as in other countries to which these products flow from the Beechwood food factory of Brown, Wills, and Nicholson in Plymouth.

FOUNDED in 1797, the concern has a long record of progressive development and has been known to generations of shopkeepers, and café and hotel proprietors south of a line drawn from London to Liverpool, more especially in the South Wales, Bristol, and Devon and Cornwall areas, as bacon and ham curers, wholesale grocers, and provision merchants. As such, the business was located for many years in the celebrated Abbey Stores, hard by the mother church of St. Andrew, in the heart of the city of Plymouth.

The Abbey Stores were destroyed by enemy action in 1941. The wholesale grocery section of the firm, which it is claimed is the largest of its kind south of Bristol, occupies part of the recently opened premises at Prince Rock, one of the city's industrial areas, which house the head office, the main grocery warehouse, and the sales room.

During 1900 a cooked meat department was opened at the Abbey Stores. Progress in this field was rapid; in 1921 a new factory was acquired in Alexandra Road, and was named the Beechwood Factory. At the time, the sawdust of beech was being used for the smoking of bacon, and it is from this that the factory and the company's registered trade mark derives its name.

The Butchery Department

All meat composing the raw materials for the many products manufactured is received in a spacious and well-arranged department from the company's own slaughterhouse at Ermington, on the outskirts of Plymouth, and from Government slaughterhouses throughout Devon and Cornwall. In this department, which is adequately equipped with chill rooms and freezing chambers, are hung quarters of beef and carcasses of pig, sheep, lamb, and calves.

A team of butchers is occupied with the boning of the meat for the different departments and with the preparation of the pig carcasses for bacon.

Sausage Manufacture

Adjoining the butchery and boning room is the sausage department, where standard sausages, as well as special ones with increased meat content, chipolata sausages, large-sized "hog puddings" (a favourite regional dish) are made. An experienced operative re-trims and selects the large chunks of meat coming from the boning department, adjusting the relative proportions of lean and fat to ensure the production of a sausage of a consistently standard composition and quality, a task requiring a "clinical eye."

The sequence of subsequent operations follows the usual lines: mincing, mixing, and filling into casings. The finished sausages

From the mixing pans, the dough is conveyed to the bun divider, which delivers buns of correct weight for each pie. The portions then pass to another machine which moulds them into shape.

Left: **The buns of dough are pressed into moulds by means of an electrically heated die which spreads out the dough to form the bottom half of the pie. Meat filling is discharged into the casing by means of a tube.**

Bottom left: **The dough for the pie lids is rolled out by automatic roller and placed on them by means of a machine.**

Bottom right: **Cornish pasties are among the many kinds of products made in the bakery department.**

are made into 1 lb. lots. Prior to packing into cartons lined with impermeable paper, they are placed in chambers for a short time during which they are subjected to a current of cold air to remove surface moisture. On emerging from the chambers, the skins are quite dry, although the drying procedure is not stringent enough to affect the contained meat.

Local distribution of the produce is effected by the company's own vans, direct to the retailers, but supplies are sent as far as London. In the latter case, the sausages are chilled immediately after manufacture and sent by rail.

The Bakery Department

A well-organised pie department handles a large assortment of individual meat pies, as well as Cornish pasties, steak and kidney pies, chicken and ham, veal, and pork pies of various weights up to 6 lb.

The dough for the pies is made in mixing pans with a capacity of 250 lb. From the mixers, it is conveyed in trolleys to the dividing machine which produces "buns" of dough of equal weight. These buns are placed in tins and pressed into moulds by means of an electrically heated die which spreads out the dough to form the bottom half of the pie. Automatically, the tins are carried under a tube from which the meat filling is discharged. They are then carried by conveyor to operatives who moisten the edges of the pastry ready for lidding.

The lids of the pies, the dough for which has been rolled out by an automatic rolling pin, are now placed on them by machine, after which the pies are baked in a coke-fired oven.

The larger pies, after cooking, receive a proportion of fresh jelly made in the factory from the raw materials derived from the meat.

The varied assortment of pies and pasties are then placed in a cooling cupboard pending packing and despatch within a few hours of manufacture.

Pilchard Canning

During the season, which lasts from May to December, the canning of pilchards forms an important part of the company's operations.

Supplies of fish are obtained from local fisheries and also from Cornwall. In Plymouth, the boats go out in the afternoon and return to discharge their catches at 4 a.m. Canning operations on these catches start at 7 a.m.

The pilchards are delivered to the factory with heads and guts already removed, hence the only preparation needed before filling into cans is the removal of the tails (effected by an ingenious semi-automatic machine made by a Plymouth firm) and de-scaling. These operations concluded, the fish are filled into 1 lb. open top cylindrical cans with the addition of brine or tomato purée.

The cans are then clinched, exhausted, double-seamed, retorted, labelled, and packed.

Above: **As the trays of pasties emerge from the drawplate oven, they are placed in a cooling cupboard prior to packing and despatch within a few hours of manufacture.**

Right: **The examination of representative samples is a routine measure.**

Meat Canning

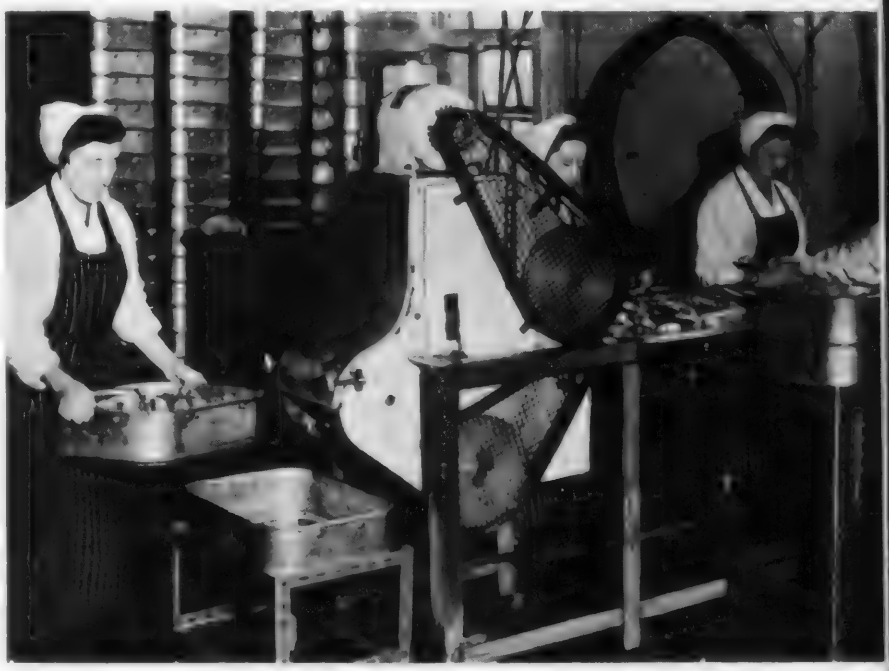
Among the canned produce figure lunch tongues, ox tongues, and stewed steak. The tins, having been filled with the material, are clinched, steam exhausted, double-seamed and, on their way to the retorts for sterilisation, are passed through a washing machine.

Meat and fish pastes in glass jars are also manufactured in the canning department and in the season, Christmas puddings.

The Bacon Department

Bacon manufacture is another of the company's outstanding activities. Pigs are drawn from the company's abattoirs at Ermington.

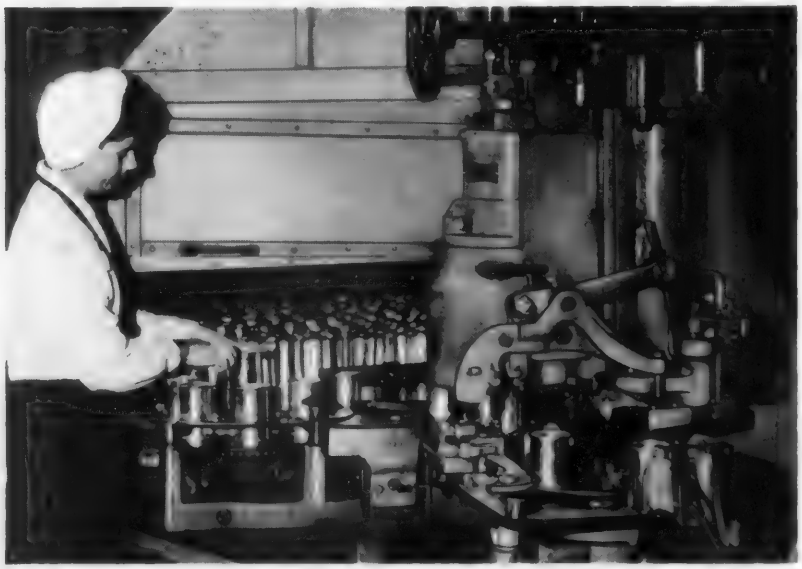
The pigs are chopped down and the blade bones removed by an electrical boning machine. The sides are cured in spacious cellars by the Wiltshire process. The procedure follows the conventional treatment — injection of



Centre right: **In the pilchard canning department, fish are tailed and graded prior to washing and canning.**

Bottom right: **After tailing and de-scaling, the pilchards are filled into 1 lb. open top cylindrical cans with the addition of brine or tomato purée.**

Lunch tongues, ox tongues, and stewed steak are handled in the meat canning department. A line of operatives weigh the meat and fill it into cans.



After the filled cans are clinched and exhausted, they are closed automatically and conveyed to the retorts for sterilisation.

Each retort, automatically controlled, is loaded with two baskets, each containing 700 cans.

brine, immersion for five days in the brine tanks, and stacking for a further 14 days, after which the sides are taken to the smokehouses, of which there are five, each with a capacity of 200 sides.

The smoke is produced from an 18 inch layer of sawdust covering the floor of the smokehouse, the smoking operation taking from 30 to 40 hours.

A useful export trade in bacon is carried on and is being further developed. Already Beechwood bacon is being consumed as far away as Singapore.

The personnel of the bacon department are "old hands" and their experience enables them to use appropriate cures catering for regional tastes at the point of destination.

The Cooking Department

In the cooking department ten production lines are occupied with a wide diversity of open-pack cooked meats, including luncheon meats, pork galantine, jellied veal, pressed beef, lunch tongues, ox tongues, brawn, stewed steak, haslet, and Devonshire Hog pudding. The large pieces of meat, pigs' heads, and hams, are cooked in "fuel-less cookers," which are heavily insulated square tanks fitted with steam coils. The meat with its cooking water is brought up to boiling point (in some cases, as with hams, to about 180°F.) when the lids of the tanks are closed down and the steam turned off. Sufficient temperature is maintained without the application of additional steam to finish the cooking. The cooked meat is then trimmed on the tables and chopped, minced, and mixed.

For certain minced meat packs, a mixer is used in which the material is subjected to a vacuum of 15 in., whereby the occluded air is expelled, to the improvement of the texture and solidity of the finished pack.

Laboratory Control

A well-equipped laboratory is at the disposal of all departments, for

the examination of all materials used in manufacture and also of the finished products.

Export and Food Schemes

The company's export trade is rapidly expanding. The market for canned meat products includes Jamaica, Trinidad, Burma, Ceylon, Cyprus, the Persian Gulf, Malta, Siam, W. Africa, Peru, Singapore, Fiji, and Gibraltar. Frozen sausages and canned meat are also sent to Bermuda.

During a visit by Mr. C. P. Brown, chairman and managing director, and Mr. G. H. Knight, director, to Canada last year, arrangements were made with stores in the principal cities to effect the delivery of gift parcels to friends in Great Britain. The scheme was a simple one; all that had to be done on the Canadian side was to fill in a form giving the names and addresses of the sender and the recipient, together with the dealer's name. A selection of five parcels at different prices was available for delivery from Plymouth to the recipients.

The New Abbey Stores

In 1950 there was inaugurated the imposing new building which houses the registered office, and two floors each measuring 27,500 sq. ft.; these serve as a warehouse for the many grocery lines handled by the company. The delivery network covers practically every town and village in Cornwall, Devon, and West Somerset, west of a line from Lynton, through Taunton to Lyme Regis—an area of about 4,000 miles.

The Manufactured Foods Fleet

To effect this, the company have split their 45 vans and trucks into two distinct fleets—one delivering its own manufactured foodstuffs from their Beechwood factory, the other delivering groceries from the New Abbey Stores.

The manufactured foods fleet consists of nine 30 cwt. vans converted from ex-W.D. trucks. For-

The final operations. The cans are labelled by machine and packed in cartons ready for despatch.

In the bacon curing process, brine is first pumped into the sides of pork; these are then immersed in brine tanks for five days and stacked for 14 days before smoking.

Right: **Cans of meat roll, mixed under vacuum, proceed on the line to the can-sealing machines.**

Preparations for loading goods are made at the Abbey Stores at 7.30 each morning, loading being started at 8 a.m. On the left, loads are being checked on to the vehicles against the original orders.

ward-control vehicles, they have a sliding door on the near side, roller shutters at the rear, and have been fitted with zinc floors and half-sides and with wooden shelving. The bulk of the manufactured foods side of the business is on a direct sale basis from van to shopkeeper. Only canned goods and bulk deliveries—such as NAAFI's quantity requirements—are pre-ordered.

Throughout the week, two of the vans are based at Truro, serving the extreme western end of the district as far as Land's End; one at Exeter, serving the south-eastern end as far as Budleigh Salterton, and one at Torrington, serving the north-eastern portion as far east as Tiverton. Each Monday morning, these four vehicles leave Plymouth for their areas with a full load, which they deliver the same day. For the rest of the week, fresh stocks are sent out from Plymouth each day.

The remainder of the fleet operates daily from Plymouth on regular schedules, giving each customer at least one delivery a week. Some districts get more frequent delivery; Plymouth shops, for instance, are supplied three times a week by two vans which operate exclusively in the urban and suburban area and sometimes make 60 to 70 calls a day.

Loads for each vehicle are prepared on the factory loading bays

Part of the fleet of delivery vehicles at the Abbey Stores ready for the day's work.

at 7.30 each morning, enabling loading to begin at 8 a.m. The daily route for each van in the fleet covers, on the average, 60 to 70 miles and involves between 40 and 50 deliveries.

Tilt-vans for Wholesale Deliveries

On the wholesale grocery side of the business, deliveries go out on order only, there being no direct sale from the vehicles. On this work, the company use standard 2, 4, and 5 ton long wheelbase trucks from which the sides have been removed; these are used to raise the height of the headboards, and tilts have been fitted.

All the vehicles operate daily from Plymouth, covering the whole area of Devon and Cornwall. Deliveries are made fortnightly in most districts and more frequently in the busier towns and holiday resorts; at the height of the summer season, extra vans are put on for the Torquay, St. Austell, Newquay, and Mevagissey districts. Plymouth shops generally are on a once-a-week schedule, but some get daily deliveries.

Maintenance Department

Although operating separately, both the manufactured foods fleet and the grocery fleet come under the same maintenance system. Up-to-date garage and workshop accommodation is provided at Prince Rock where all vehicle maintenance is carried out. The firm also carries out its own body repairs and repainting; this side of the work is undertaken by a subsidiary company.

Welfare and Amenities

Canteen facilities, education, sport, and welfare are outstanding features. Apart from the well-equipped canteen at the Beechwood factory, the Staff Welfare Society is housed in the building at Prince Rock. The dining room, served by a stream-lined kitchen, has a capacity for 300 people. It is a handsome room, also used for a number of social activities, including dances, concerts, and dramatic performances.

An interesting side-light on these activities is that they are not only self-supporting, but any surplus profits from them are devoted to the help of local civic organisations.

Cricket, football, and lawn tennis are well catered for. Hockey and netball are played on the sports ground, and a club room is available for the entertainment of visiting teams. Among the other numerous activities are an old age pension club, attendance on the sick, and savings groups for holidays and sickness.

From all aspects, both official and personal, the overall impression of this long-established firm is one of good organisation and of enthusiasm on the part of the employees of every grade. In the well-worn naval phrase, it is "a happy ship."

SUPPLIERS OF EQUIPMENT

Stoner for raisins and elevator: *J. Collis and Sons.*
Labeller: *Crawford Machinery Co.; Wright and Marvin.*
Fuel-less ham cooker: *W. J. Hubbard and Sons.*
Vacuum mixers for meat: *Morton Machine Co.*
Transport: *Vauxhall Motors.*
Filling machine: *Peerless and Ericsson.*
Table conveyor, baskets, fish tailing and grading machine: *Norman and Eldred; Madge and Son.*
Scales: *Berkel Auto-Scale Co.*
Seamer and cans: *The Metal Box Co.*
Exhauster and can conveyor: *G. C. Engineering Co.*
Retorts: *John Fraser and Son.*
Stacker: *Lansing Bagnall.*
Labels: *E. S. and A. Robinson.*
Cartons: *Thompson and Norris Manufacturing Co.; Thames Board Mills.*

The photographs on pages 173, 174, 175, 176, and the top of 177 are Leonard Hill copyright; the three remaining ones are published by courtesy of Vauxhall Motors.

Powdered Orange Juice

THAT high quality natural juices can be reduced to the dry state, packaged, preserved, reconstituted, and used with good results is demonstrated by a new process which has been devised at the Bureau of Agricultural and Industrial Chemistry's Western Regional Research Laboratory, Albany, California (*The Canner*, **116**, 3, 13).

The process begins with juice concentrated at a low temperature, followed by a drying process in which a thin layer of concentrated juice is placed in pans. These are placed in a vacuum chamber on shelves that can be heated. The combination of heat from the shelves and the vacuum applied causes the juice to puff up to many times its original volume as it dries. On removal from the vacuum chamber, the dried puffed juice readily powders.

Another feature of the process is the addition to the powder of an adequate amount of specially prepared, stabilised natural orange oil, as flavouring. This is essential because the natural flavour essence of the orange is largely lost during drying.

The stability of the product under warm storage conditions is due to the "locking in" of the flavour by a recently developed commercial method of preparing the added orange oil and to packaging the product in cans containing small inner packages of desiccant. Thus very low moisture content, down to 0·5 per cent., is achieved.

For most severe storage conditions (100°F. for a period of months), powders containing 40 per cent. of corn syrup solids have been highly successful. Further research, with and without edible additives, is being carried out.

An attractive feature of the new powder is its ease of reconstitution. An appropriately measured quantity of the powder dropped into a glass of water dissolves immediately and remains dispersed in the water without settling out. The colour is that of fresh orange juice and tasters have uniformly praised the flavour as that of natural orange. Vitamins A and C and other nutritive factors are well preserved even after prolonged storage.

Because the new process has succeeded so well in laboratory and pilot plant studies, the Army Quartermaster Corps has procured a small trial supply for testing purposes. The product is not yet available commercially.

Correspondence

To the Editor,

FOOD MANUFACTURE

Chalk in Bread

DEAR SIR,—When the official decision to fortify brown flour with calcium was made, the reason given was that this type of flour contains phytic acid—a substance which is supposed to prevent the absorption of calcium. Actually the amount of calcium added was calculated to be just sufficient to counteract the effects of phytic acid. I have shown long ago that the whole phytic acid business is nonsense.

The Government has now shifted its ground. We have a statement from the Minister of Food that chalk is to be added to flour because of a deficiency of that substance in the nation's dietary. This is absolutely untrue. In our experiments relating to calcium requirements it was found that the requirement of an adult is between 0·39 and 0·57 g. per day.

Before the adulteration of our bread, I had been looking for years for cases of calcium deficiency in an extensive hospital practice, and also in an institution where normal people are examined periodically; but not a single case was found. A dental surgeon, too, who made X-ray examinations of the teeth as routine, could find no single case. Nor have I ever seen a pathological specimen of an adult in which calcium deficiency was a feature of disease.

I have made a large number of enquiries from patients attending the Heart Hospital with regard to the diet they were taking at home. In no single instance did I find that the calcium intake was below requirement. This was during the period before calcium was added. Since then the consumption of milk, which is rich in calcium, has increased enormously.

I know only one authority who was dissatisfied with our calcium intake. The method was simple. A high figure of requirements was assumed gratuitously without a research, and this was made into an ideal optimum requirement. By such a method the particular authority proved that 20 million people are suffering from underfeeding and calcium deficiency. I challenged the authority to produce one dozen adults who exhibited signs of calcium deficiency, and they were unable to do so. But even this authority did not recommend adding calcium to bread. It recommended the provision of additional foodstuff rich in calcium.

It can be affirmed with a high degree of certainty that the calcium intake, apart from that contained in adulterated bread, is ample, and even unnecessarily high. While it can be definitely affirmed that there is no calcium deficiency, there is considerable evidence that an unnecessary calcium intake is harmful.

In experiments with rabbits I found that the calcium content of the walls of the blood vessels in an intake of calcium above requirements is double that of normal. Diseases which are characterised by deposits of calcium on the walls of the blood vessels, such as hardening of the arteries and high blood pressure, are alarmingly on the increase; the late Sir Jack Drummond, who was actually an adviser to the Ministry of Food under Lord Woolton, expressed his conviction that high calcium intake predisposes to stones in the kidney.

In any case bread is not a suitable vehicle in which to make good calcium deficiencies, for some people eat many times as much bread as others; so that in some instances the calcium intake will be increased above normal and in others the extra calcium in the bread will be negligible. It is also a fact that calcium deficiency cannot be rectified by the simple administration of calcium. It is necessary to administer other substances in order to make up the deficiency.

In a letter to *The Times*, Sir Edward Mellanby has given the reason which prompted him to make the recommendation to fortify the flour with calcium. He wanted to prevent brittle bones and bad teeth. Brittle bones are not caused by calcium deficiency. Indeed, there is a case of this condition on record that the disease developed while the patient was taking large doses of calcium as medicine. In any case, the disease is so rare that adding calcium for this purpose would be like burning a house to roast a pig! It has also been established that bad teeth are not due to calcium deficiency. There is no scientific reason at all for adulteration of our bread with chalk.

Yours faithfully,

I. HARRIS,

Director of Institute of Research for the Prevention of Disease.

Liverpool.

Material Handling Systems

DEALING with modern stores systems and the material handling methods associated with them in medium and light engineering industries, and other trades, is a book* which should prove of exceptional interest to managements unaware of the benefits to be gained from using these techniques. The author, who is Stores Controller of a large group of engineering companies, describes in straightforward, practical terms the results of introducing such techniques to one particular typical plant, tracing the progress of material from its reception in the raw state to its final despatch in the form of finished goods.

The book is lavishly illustrated with photographs showing every stage of the system in operation. Especial emphasis is given to the use of fork-lift trucks and pallets, now recognised as probably the most important contribution made to industrial stores handling for many years. Their use will increase production, utilise floor space more effectively, and help the movement control of material.

The book also deals with such matters as labour incentives, the economical disposal of swarf and scrap, and stocktaking, and these again are looked at in the light of the latest practice.

* *Material Handling in Works Stores: The Fork-Lift Truck and Pallet System.* By L. J. Hoefkens. Pp. 108. Iliffe and Sons. Price 10s. 6d.

The Vitamins

Progress in 1952

F. A. Robinson, M.Sc. Tech., LL.B., F.R.I.C.
Allen & Hanburys Ltd., Ware, Herts.

Part II

Continuing his review of developments during the year 1952 in the knowledge of the vitamins, the author pursues the discussion of the relationship of pantothenic acid to coenzyme A. Also discussed are folic acid and the citrovorum factor, the vitamin B_{12} complex, strepogenin, and thioctic acid.

METHODS of isolating and purifying coenzyme A from various sources have been described,[79] and the possible existence of a group of coenzyme A-active substances has been suggested. A typical preparation contained 26 per cent. of pantothenic acid, and the acid hydrolysate contained β-alanine and 2-mercaptoethylamine disulphide; the amino group of the latter is linked to the carboxyl group of pantothenic acid.

Coenzyme A yields pantothenic acid-4′ and -2′4′ phosphates as well as adenine nucleotides and 2-mercaptoethylamine on alkaline hydrolysis;[80] the 2-mercaptoethylamide of the cyclic 2′4′ phosphate is also probably formed. The 2′4′ phosphate, pantetheine, and 5-acyl derivatives of pantetheine have been synthesised.[81]

Coenzyme A appears to function as a catalyst of acetyl transfer through its terminal thiol group, and various synthetic acetyl thiol amines exhibit similar properties.[82] Acetyl coenzyme A is probably a thiol ester of coenzyme A and acetic acid.

In addition to its role as a component of the coenzyme of acetylation and deacetylation reactions, pantothenic acid also appears to be concerned in the metabolism of cholesterol,[83] although this may be only a special example of an acetylation reaction since cholesterol has been shown to be synthesised from acetic acid. Thus, in pantothenic acid-deficient rats a cholesterol-rich diet does not cause fatty livers as it does in normal rats. Again, the adrenal glands of pantothenic acid-deficient rats show a reduction in their cholesterol content owing probably to decreased synthesis rather than to increased conversion into adrenal cortex hormones.

Apples, pears, and tomatoes contain 40 to 70 μg. of pantothenic acid per 100 g., and rose hips and blackcurrants 400 μg. per 100 g. Kale and carrots contain 350, cauliflower 680, and nuts 75 to 380 μg. per 100 g.[68]

Folic Acid and the Citrovorum Factor

Several methods of synthesising and purifying folic acid have been described, but these are mainly modifications of known methods.[84]

An improved medium for the assay of folic acid with *L. casei* has been described.[85]

In the lamb, folic acid deficiency produces leukopenia and diarrhoea, followed by pneumonia and death.[86] White cell regeneration was brought about by folic acid. A deficiency of folic acid in the rat after mating results either in death of the foetuses or in the development of multiple congenital abnormalities in the offspring.[87] Rats deficient in folic acid incorporated less C^{14} formate into the purine fraction of the liver nucleic acids than did normal rats.[88] Less choline was also synthesised from C^{14} methanol by folic acid-deficient rats than by normal rats.[89]

Rats can synthesise folic acid when given *p*-aminobenzoyl glutamic acid together with xanthopterin.[90]

Folic acid is destroyed by exposure to light and the effect is enhanced in presence of riboflavin.[91] The destruction is more rapid at *p*H 4 than at *p*H 6·5, and is less in an atmosphere of nitrogen than in air; *p*-aminobenzoyl glutamic acid and a carbonyl compound are produced.

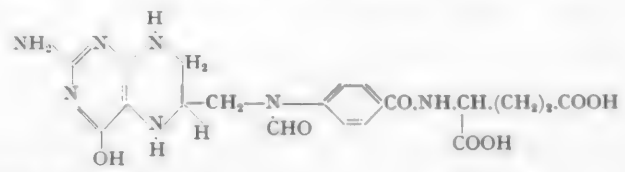
A derivative of folic acid known as the citrovorum factor, because, unlike folic acid, it stimulates the growth of *Leuconostoc citrovorum*, has now been shown to be N^{10}-formyl N5:6:7:8-tetrahydro-folic acid.

Leucovorin, a synthetic isomer of the natural citrovorum factor, is 5-formyl-5:6:7:8-tetrahydro-folic acid and is a less effective growth factor than folic acid for chicks and turkeys, *S. faecalis* and *L. casei*.[92]

The Vitamin B_{12} Complex

Although investigations into the chemical constitution of vitamin B_{12} have continued throughout the year, no further information has been published on the nature of the non-ribazole portion of the molecule. The structure of the ribazole portion of the molecule has been confirmed, however, and considerable light has been thrown on the interrelationships of the several members of the vitamin B_{12} group. Vitamins B_{12}, B_{12b}, and B_{12c} have been isolated from *S. griseus* fermentations.[93]

Vitamin B_{12c} contains a nitrito group and results from the treatment of vitamin B_{12b} with nitrous acid. It can be re-converted into vitamin B_{12b}, which contains a hydroxo group, by treatment with sulphamic acid. The so-called



The citrovorum factor.

vitamin B_{12}, is now known to be identical with vitamin B_{12b}. Acidic cobalamins have also been made; they contain two monovalent acidic ions or one divalent acidic ion such as sulphite and are very unstable. Hydroxo-cobalamin (vitamin B_{12b}) can be determined in presence of cyano-cobalamin (vitamin B_{12}) by taking advantage of the fact that the former is rapidly destroyed in presence of ascorbic acid, whereas the latter is stable.[94]

A few further details have been published about the method of producing vitamin B_{12} by fermentation.[95] As produced by fermentation with *S. griseus*, vitamin B_{12} exists partly in the form of a complex from which the free vitamin is liberated by heat in presence of water. In a method of preparing it from liver extract the latter was incubated with papain, extracted with phenol-chloroform, purified by chromatography on alumina, and crystallised several times from aqueous acetone. Alternatively, purification can be effected by partition chromatography on moist silica gel using a mixture of phenol and a non-polar solvent as the mobile phase. Vitamin B_{12} containing radioactive cobalt has been made by activation in the atomic pile[96] as well as by fermentation with *S. griseus* in presence of radioactive cobalt; a similar method was used to make vitamin B_{12} containing P^{32}.

In addition to the members of the vitamin B_{12} group already referred to, vitamin B_{12}-like compounds having microbiological activity but no anti-pernicious anaemia activity have been described.[97] Thus, a red pigment was isolated from fish solubles and became active in pernicious anaemia after treatment with cyanide; it is believed to be a peptide conjugate of vitamin B_{12}.

Again, a substance possessing vitamin B_{12} activity for *E. coli* was obtained from calf rumen contents and faeces and separated by partition chromatography into four components, one of which was true vitamin B_{12}. One of the fractions was antagonistic to vitamin B_{12} activity in chicks, while another fraction enhanced the response. The fraction which accounted for 70 per cent. of the total activity may be identical with the so-called vitamin B_{12m} and B_{12f} isolated from pig manure and rat faeces respectively; it has been named cyano-ω-cobalamin.

Another vitamin B_{12}-like factor which is inactive on animals has been termed pseudo-vitamin B_{12}. It yielded a red fraction containing cobalt on hydrolysis, and adenine in place of dimethylbenzimidazole.

Estimation of Vitamin B_{12}

Two micro-organisms are in general use for the assay of vitamin B_{12}. The first is a mutant strain of *E. coli* which also responds to methionine, and the other is *L. leichmannii* which responds also to thymidine. Various refinements in procedure have recently been described.[98] Thus the limits of error have been reduced by using a particular experimental design with eight tubes per unknown. The effect of oxygen on the response has also been investigated and a method has been devised for releasing bound vitamin B_{12} from animal tissues.

The presence in crude liver extracts of substances which augment the response of both *L. leichmannii* and *E. coli* to vitamin B_{12} has been reported.[99] In the plate assay these substances may form a zone which can readily be distinguished from the vitamin B_{12} zone and they can also be separated by paper chromatography. One of these substances is stable to alkali.

Physical and chemical methods of estimating vitamin B_{12} have also been described.[100] The pure vitamin can be estimated by means of the spectrophotometer, and mixtures of vitamin B_{12} with other vitamins can be assayed spectrophotometrically after chromatography on either alumina or a mixed cation-anion-exchange resin column. A refinement of the ordinary method has been suggested depending on measurement of the difference between the visible spectrum of vitamin B_{12} and that of its dicyanide complex, formed in solutions containing excess cyanide ions. The most satisfactory chemical method for estimating vitamin B_{12} is to measure the amount of cyanide released on illumination of the test solution.

Some workers employ rats for measuring vitamin B_{12},[101] but care has to be taken to ensure that the diet produces an adequate degree of vitamin deficiency; under good conditions the rat assay gives results comparable with the microbiological method. With certain types of meat, however, the rat growth method gives very much higher results. Using such an assay method it was found that beef liver contained from 20 to 50 times and beef kidney 10 times as much vitamin B_{12} as beef muscle. The vitamin B_{12} content of milk was not increased by feeding the cows with either vitamin B_{12} or cobalt.[102] It has been estimated that weanling pigs require at least 4 μg of vitamin B_{12} per lb. of total ration.[103]

Vitamin B_{12} in Biochemical Transformations

Crystalline vitamin B_{12} or an equivalent amount of vitamin in the form of liver enabled rats to grow normally on a diet deficient in labile methyl donors but containing homocystine and folic acid.[104] Food intake was also increased, and, since animals with vitamin B_{12} deficiency have a lower fat content but a normal protein content, it was concluded that the vitamin affects carbohydrate or fat metabolism but not protein metabolism. This has been confirmed by a study of the relation between vitamin B_{12} and choline and methionine.[105]

Vitamin B_{12} was essential for the synthesis of both these substances, but for the synthesis of choline, folic acid was also required, and both were necessary for the maximal utilisation of methionine or betaine. On the other hand, vitamin B_{12} did not appear to be concerned with the conversion of formate or serine into choline. Vitamin B_{12} increased the excretion of N^1-methylnicotinamide, thus confirming its association with the methylation mechanism. Vitamin B_{12} may be concerned with the synthesis of serine from glycine.

When saliva or gastric juice is added to vitamin B_{12} it ceases to stimulate the growth of *L. leich-*

mannii.[106] The factor which thus combines with vitamin B_{12} is more stable in neutral solution than in acid solution, and heating a mixture of gastric juice and vitamin B_{12} under conditions which left most of the latter in a microbiologically inactive form destroyed the ability of the juice to potentiate the action of orally administered vitamin B_{12} in a pernicious anaemia patient. This suggests that the vitamin B_{12}-binding factor is not identical with Castle's "intrinsic factor." The "intrinsic factor" inhibits the absorption of vitamin B_{12} by *E. coli*, while lysozyme has no effect. It has been suggested that pernicious anaemia is caused by the removal of vitamin B_{12} from the gut by a greatly increased microbial flora under conditions of achlorhydria and lack of intrinsic factor in the gastric juice.

Vitamin B_{12} Deficiency

The effects of vitamin B_{12} deficiency differ in different animals.[107] Thus vitamin B_{12}-deficient rats produced smaller litters than normal and the individual animals were smaller. Most animals showing a reduced growth rate also developed anaemia on vitamin B_{12}-deficient diets. Chicks, however, were exceptional in maintaining a normal blood picture although the growth rate was retarded. Nucleic acid metabolism in the rat was adversely affected by vitamin B_{12} deficiency, while the nitrogen metabolism of chicks was disturbed.

Vitamin B_{12} is stored mainly in the liver and kidneys, and, to a smaller extent, in the intestines. When large amounts of the vitamin were injected a high proportion was excreted in the urine, but most of the vitamin was excreted in the faeces following oral administration.[108] In humans, good retention of the vitamin following intramuscular injection of up to 75 μg. was observed.[109]

Strepogenin

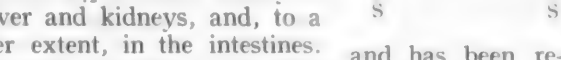
Strepogenin has previously been reported in enzymic digests of casein, and it can be made by digestion of casein or other proteins such as insulin.[110] The biological activity appears to vary according to the method of preparation. It is a peptide which appears to form an integral part of the protein molecule from which it is derived. It stimulated the growth of *L. casei*, and this micro-organism has been used for estimating it.[111] Liver preparations apparently containing this substance have been claimed to increase the growth of children,[112] but there is as yet no evidence to indicate that strepogenin is the factor which is responsible.

Tests of synthetic peptides indicate that all peptides containing L-alanine stimulate the growth of *L. casei*, although the amino acid itself is inactive. Tyrosine-containing peptides were also inactive but stimulated the growth of *S. faecalis*.[113]

Thioctic Acid

The factors previously described as protogen and α-lipoic acid have now been shown to be one and the same substance. This can be prepared from enzymic digests of liver, and purified by countercurrent distribution and chromatography.[114] It stimulates the growth of *Lactobacilli* and of *Tetrahymena geleii*, and the identity of protogen and α-lipoic acid was established by tests with the latter organism.[115]

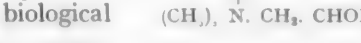
The structure of α-lipoic acid has been determined by degradation and confirmed by synthesis.[116] It is a cyclic disulphide with the following structure:



and has been re-named thioctic acid.

It appears to be related biochemically to coenzyme A, being essential for the acetylation reaction, but not for the oxidative phase of pyruvate oxidation.[117] Several related compounds have been made and show some biological activity.

Vitamin B_T, a growth factor prepared from tomato juice which stimulates the growth of *L. lactis*, has now been shown to be identical with the betaine, carnitine.[118]



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(*Concluded on page 184*)

British Pharmacopoeia, 1953

THE publication of a new Pharmacopoeia* is an event in the medical and pharmaceutical world, but it is not without its interest to the food industry. At one time it was proposed to issue a fresh edition every 10 years but, owing to the first and second world wars, periods of 18 and 16 years respectively elapsed, and it has now been found that advances in therapeutics are so rapid that a five-year period is more than ample between each edition.

Although the General Notices include a statement to the effect that: "The standards of purity and strength stated in the Monographs of the Pharmacopoeia apply to articles which are intended for medicinal use but not necessarily to articles which may be sold under the same name for other purposes," the food manufacturer will do well to remember that pharmacopoeial standards are generally expected of substances employed as foods or in foods, because the quantities taken as food may be larger than those used medicinally as, for example, with citric or tartaric acids in soft drinks.

The changes in the items in the new edition as compared with that of 1948 are not as numerous as those made when the latter appeared. This is only to be expected in view of the fact that a war produces numerous changes in medical treatment and that no less than 16 years had elapsed. The changes in format are, however, revolutionary and will be welcomed most heartily by those who are not members of the medical or pharmaceutical professions. For the first time English becomes the formal language and every monograph carries an English title, so that the layman can look up almond oil instead of *Oleum Amygdalae*, or industrial methylated spirit instead of *Spiritus Methylatus Industrialis*.

At one time it was a common complaint that the British Pharmacopoeia was merely a cookery book and therefore not worth the attention of chemists. The amount of knowledge that an analytical chemist now requires is so great that he is generally glad of a cookery book, which will give him in clear concise language the exact information he needs. If a substance is in the Pharmacopoeia it is possible to find most of what is required for routine purposes either as regards standards of purity or methods of analysis, the appendices being a mine of information on the latter. For instance, four different methods are given for the determination of alcohol, according to the type of preparation required to be analysed.

If the product is a straightforward one, such as tincture of *nux vomica*, the alcohol can be distilled off directly in the distillate; if it contains a volatile oil, as in the case of spirit of peppermint, the volatile oil is removed by saturating with salt and extracting with petroleum ether before the alcohol is distilled. If emulsifying substances and volatile oil are both present, as in the case of tincture of lemon, the solution is distilled and the volatile oil is removed before undertaking a second distillation; while if a volatile solid such as camphor, and a substance such as ammonia, are both present, the volatile oil is first removed and the solution acidified or made alkaline with a non-volatile acid or alkali as required before distillation. Other modifications for dealing with such volatile constituents as iodine or inflammable ones like guncotton are also described.

The only difficulty for the food chemist is that the Pharmacopoeia appreciates that only small quantities of substances may be available for analysis and therefore allows for the determination of alcohol by quadruple bulk. A food manufacturer may require slightly more exact determination for excise purposes. It does, however, insist that the final distillate must give the same alcohol contents either by specific gravity or by refractive index. The determination of alcohol has been given as an example; there are 160 pages of appendices dealing with methods of analysis of interest to the chemist, including one on the determination of foreign organic matter in powdered crude drugs and spices.

The food manufacturer, who is interested in the fortification of any of his products with vitamins, should not fail to consult the standards and methods of analysis contained in this book.—T. McL.

* *British Pharmacopoeia, 1953*. Pp 894+xxiv. Published for the General Medical Council by the Pharmaceutical Press. Price 50s.

The Vitamins

(*Continued from page* 183)

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Debittered Soya

Osman Jones, F.R.I.C.

The scarcity of many articles commonly used in the production of food which rose to a peak during the war years, when manufacturers were compelled to seek substitutes for meat, cereal products, spices, and other commodities, is only now beginning to subside. In this article the author traces the use of soya products from war-time to the present day.

DURING the war years, whale flesh was used in lieu of beef, pork, and mutton, semolina in place of rice in sausages, soya as a protein concentrate in various foods. In spite of much endeavour to overcome meat scarcity, it remained the outstanding food for which no satisfactory substitute could be found. As it constituted the most important source of protein, the position gave rise to serious misgiving. The Government considered that some additional protein was essential in the diet, and found in soya beans a substance which was richer in protein than meat, although the protein is not considered to be of quite the same class as meat. At the height of the crisis, sausage makers were compelled to reduce the meat content of fresh sausages to 37½ per cent. and to add 7½ per cent. soya. This *theoretically* produced a sausage equivalent in nutritive value to one containing 60 per cent. meat.

It was unfortunate that this type of soya product imparted a most unpleasant flavour to the commodities in which it was used. Although people had to consume these preparations, for want of anything better, it so prejudiced them against soya that once it could be done without no manufacturer dared to include even a small proportion in his goods, if he wanted to continue in business.

Sources of Soya

The chief sources of soya are the Far East, Africa, and the Americas. Most of the soya used in Britain is imported from East Africa and Brazil. The crop is not unlike a French bean in appearance. The seed is round, about the size of a pea, and usually yellow in colour. It contains no starch, about 40 per cent. protein, and 20 per cent. fat. Compared with skim milk powder the protein content is about the same but that of the fat is higher.

Flavour Problems

From the point of view of nutrition the protein is nearly equal in value to that derived from beef, and superior to that of any other known edible vegetable.

The only disadvantage of using this valuable source of protein has been that the bean possesses a bitter flavour. Some of the soya used during the war consisted of the crude material. It was considered likely that if some of the fat could be removed the flavour of the residue would be improved, and therefore a variety of the flour, known as "soya grits," was imported, which manufacturers were compelled to use. The flavour of these grits was not much better than that of the untreated flour.

The above was the position towards the latter part of the war period, and it is not to be wondered at that appeals were made by sausage manufacturers against the use of soya grits under compulsion, not because there was any desire to reduce the nutritive value of the food, but because it was most undesirable to continue to produce articles of food which were distasteful to the public.

So much for the past story of soya and the explanation for its unpopularity. Shakespeare said, "A substitute shines brightly as a king until a king be by," but it sometimes happens that in a search for a substitute a discovery is made. What was to be a makeshift turns out to be a real and permanent gain. It seemed a thousand pities that such a valuable source of nourishment as the soya bean should be rejected because of its unpleasant flavour.

Investigation was commenced to find means of retaining the full nutritive value of the flour and of removing the bitter, beany taste. Before this experimental work had been finally completed, the Government prohibited the use of soya in sausages and the like, largely because they realised that sausages were an important item in the diet and materially helped out the meagre meat ration, but that the public had come to regard sausages with dislike and, in many cases, preferred to go without them.

During the year 1951 the meat supply position again reached the point of acute shortage, and an Order was made by the Ministry of Food to the effect that if manufacturers cared to do so they could substitute 10 per cent. of the meat in sausages with 6 per cent. separated milk powder. In 1952, a further Order fixed the minimum meat content of pork sausages at 65 per cent. and of beef sausages at 50 per cent., and this Order made it permissible for makers to use soya and separated milk powder in sausages if they so desired, but not as substitutes for meat. Now that sausages are freed from restrictions, manufacturers are at liberty to use either of these materials in their products. When the Ministry of Food permitted the use of soya in sausages it was because they were satisfied that the debittered preparation constituted a suitable and desirable article for the purpose.

Success of Debittered Product

In spite of the somewhat sceptical opinion held by some prominent members of the trade, it was decided to submit to an independent tasting panel sausages containing up to 10 per cent. of debittered soya along with sausages containing none. All samples were tasted under a code mark so that

no bias should affect the findings of the panel. To the surprise of many, 75 per cent. of the votes were cast in favour of those sausages containing the soya product.

Uses of Debittered Soya

This test has been repeated by submission of samples to other independent tasting tests and the results confirmed those stated above. It therefore appears that the prejudice against the use of soya in meat products can no longer be substantiated. Many sausages are being produced today in which it is an ingredient. It serves at least two purposes—to increase the nutritive value and to improve flavour and cooking qualities.

Debittered soya is also being satisfactorily used in the preparation of other meat products, such as pies, luncheon sausages, and in small goods in general.

The confectionery trade have long been familiar with it, and ice cream manufacturers have turned to it with interest.

After an unpropitious entry into the food industry and the undergoing of severe birth pangs, soya should now take its place as an article of important nutritional value in the human diet. In order that it may be used with confidence it is essential that only the debittered product should be employed. If properly carried out, the process of debittering also destroys its enzyme activity, and thus removes the danger that it will impair the keeping quality of those products with which it has been incorporated.

If a manufacturer finds it necessary to make some reduction in the amount of meat in his sausages, he can still maintain their original nutritive value by the introduction of a proportion of debittered soya flour.

FUTURE ARTICLES

The June issue of FOOD MANUFACTURE will include the following articles: Illustrated description of a toffee factory; "Transport and the Food Industry," Part V, by Graham Saville; "Pressure Cooking and Cooling," by L. C. Davis; and "Lactic Acid Bacteria in the Meat Industry."

Natural Colouring Matters for Foodstuffs

By no means all of the many dyestuffs occurring in nature can safely be used in foods for human consumption. The German Research Council for Edible Dyes only specifies three substances as permissible without any restrictions: Carotene, chlorophyll, and cochineal (carminic acid). But even the use of these, in themselves innocuous materials, may be harmful if the process of extraction leads to the inclusion of solvent residues, or to chemical modification, or to failure to eliminate all traces of harmful accessory substances.

The colouring of cheese with natural dyestuffs raises special problems. Whereas the oil-solubility of most varieties of carotene is an advantage for the coloration of margarine, for instance, the lack of water-solubility is a disadvantage in the case of cheese. It is true that treatment of carotene with alkali gives a water-soluble dyestuff with an orange-yellow colour, but too little is known about the physiological effects of this comparatively new dyestuff to justify its use before tests have been conducted.

An alternative to alkali-treated carotene as a cheese colour is the dye of the annatto seed whose essential chemical constituent is bixin, a carotenoid related to the dyestuff of saffron in the sense that bixin is the monomethyl ester of a dicarboxylic acid (norbixin) homologous with the acid entering into the constitution of the saffron yellow glucoside. Both bixin and norbixin are soluble in oil but insoluble in water. Treatment with sodium hydroxide yields the sodium salt of norbixin which is soluble in water. A recent German food regulation forbids the use as a cheese colour of any synthetic dyestuff, and the only suitable alternative among natural water-soluble colours is the sodium salt of the norbixin of annatto seed. It is stressed, however, that the crystalline bixin from which the salt is prepared must first be quite free from accompanying resinous substances. (*Dr. Hans Werner, Fette und Seifen, January*, 1953.)

Britain's Food in Peace and War

A LITTLE volume* of some 200 pages will appeal to the general reader as well as the specialist. In a first short chapter, the author takes us back through the centuries and emphasises how much better off we are, despite food rationing, than were our forbears.

There follows an interesting chapter on national and regional food preferences; details are given of the foods peculiar to particular counties in the British Isles. This is followed by a discussion on food consumption between the first and second world wars; the effects of the second world war on Britain's sources of food supplies; and food consumption during its course.

Other chapters are concerned with food controls; rationing; price regulations; Government purchasing of food; communal feeding; food supplies and consumption since the war; world food supplies; international organisations concerned with food and agriculture; and development schemes in the Commonwealth and colonies.

In the chapter in which Government purchasing of food is referred to, the author treats the controversial subject of bulk buying with considerable caution, being content with setting out its *pros* and *cons*, and avoiding any expressions of personal opinion.

A short chapter on prospects for the future concludes the book, except for a statistical appendix, selected bibliography, and a very good index.

Those who are interested in obtaining a good general idea of the subject, uncluttered with confusing statistics, should read this book.

* *Britain's Food Supplies.* By K. G. Fenelon, M.A., Ph.D. Pp. 212 + ix. Methuen and Co. Price 15s.

Devising New Meat Products

Research on canned meat products, sausage and smoked meats, dairy and cheese products, poultry, and frozen, precooked foods, with the object of their improvement and the devising of better modifications, is the function of the development laboratories built by Armour and Company at their Chicago plant.

THE different departments composing the Armour laboratories are air conditioned, with walls of glazed tiles or glass. All operations concerned with the preparation of food are carried out in the kitchen—a long room, triangular in shape, with a work table running the entire length of the long side. Along the other two walls are a two-door refrigerator, range, grill, deep fat frier, baking oven, warming oven, smokehouse, and cooker. Covering the whole of the cooking equipment is a stainless steel hood, forced ventilation being used to draw out odours.

In another corner of the room are located a retort and a can closing device, together with a large cabinet in which all spices used by the meat packing industry are stored.

In the preparation room, equipped with a chopper, mixers, scales, and other items, meat is prepared for canning, and tests are made on fresh and dried sausage.

The Preparation Room

Separated from the kitchen by a glass partition is the preparation room where tests on fresh and dried sausage are made and meat is prepared for canning. Similar in shape and arrangement to the kitchen, this room is equipped with a chopper, a mixer, vacuum mixers, scales, meat truck, and a spice cabinet.

Two rooms, one held at 98°F., and the other at 130°F., in which sample cans are incubated, provide optimum temperature conditions for the detection of bacteria in insufficiently sterilised cans. There is also a large refrigerated room, a sharp-freeze room, and a room which houses air conditioning equipment, smoke-making device for the smokehouse, and all control equipment.

Stainless steel work table and other equipment in the kitchen.

Work of the Tasting Laboratory

In the tasting laboratory, taste test panels, composed of Armour office and plant employees, compare and evaluate products. There is also a laboratory office which is so located that the tasting laboratory, kitchen, and preparation room are visible from it.

On the theory that the purpose of seasoning is not to cover up poor flavour but to make food more interesting and palatable, the laboratory staff experiment to find exactly the right seasoning for each product.

In an attempt to overcome some of the objections which some people have to canned meats, such problems as the stability of meat sauces, changes of flavour due to processing, undesirable changes caused by the addition of sugar or salt or some other ingredient, and the compatibility of spices are being studied. It has been found, for instance, that the use of certain spices in meat and in the sauce may produce poor results when combined.

The products kitchen maintains checks to see that products which it has developed are prepared ac-

(*Continued on page 189*)

Transport and the Food Industry

Part IV

Graham Saville

When goods become damaged or lost during transit, it may be necessary to lodge complaints and claims. In the fourth of this series of articles, the author discusses limits of liability and the methods of making claims.

THE conditions applying to traffic forwarded by railway goods service are rather complex, but the broad division of risk should be appreciated. The three main sets of conditions of interest to food concerns are company's risk, owner's risk, and damageable goods not properly protected by packing.

The conditions applying to consignments will be determined by the character of the goods and the nature of the packing. Broadly speaking, it can be said that the bulk of traffic is carried under the railways company's risk conditions, under which the railways are responsible for the goods except when loss or damage occurs from some special circumstances, such as an Act of God or inherent vice.

Food manufacturers should, however, appreciate that even when loss or damage is caused by such special circumstances, the Railway Executive in order to escape liability must be able to show that they used all reasonable care and foresight in the carriage of the goods. On the other hand, if the trader is guilty of fraud, the Railway Executive is usually relieved of liability.

Owner's Risk Conditions

The proportion of goods which are forwarded under owner's risk conditions is much smaller; under them, most of the liability is transferred from the railway to the trader. The Railway Executive will, however, be liable if loss or damage is caused by their wilful misconduct.

There are three exceptions to this general position regarding liability which apply when the Executive is unable to show that the non-delivery, pilferage, or misdelivery was not caused by their negligence or misconduct.

The first exception really means that the Railway Executive is liable for non-delivery unless it is caused by accidents to trains or to fire. Where pilferage has occurred the Railway Executive is liable, subject to the packages being protected otherwise than by paper or other packing readily removable by hand and also provided the pilferage is pointed out to a servant of the Railway Executive on or before delivery.

The third exception is not of similar importance as it refers to misdelivery.

Packing of Goods

The third set of conditions applying to damageable goods not properly protected by packing is rather difficult to understand. It is, however, essential that food manufacturers should appreciate their position under such conditions, as a considerable volume of traffic is carried as damageable goods. At the present time, many foodstuffs are packed in fibreboard containers, and unless these comply with the conditions laid down by the Railway Clearing House, they will normally be classified as non-certificated. This means that the consignments will be carried only as damageable goods.

Under damageable goods conditions the Railway Executive is not liable for loss or damage unless it can be shown that it arose from their wilful misconduct or that the loss or damage would have occurred had the goods been properly protected by packing and in circumstances where the Railway Executive would have been liable had the goods been carried under their ordinary company's risk conditions.

Many food manufacturers who make some use of passenger train services should be aware of the main difference between the conditions applying to goods train traffic and those covering passenger train traffic. The difference applies to owner's risk conditions, where with passenger train traffic the Railway Executive's liability is limited to 75 per cent. of the net invoice value of the merchandise.

Carriage by Road

The conditions applying to traffic carried by road are not as distinct as with rail traffic. Many "free" hauliers have their own conditions which must be carefully scrutinised. The Road Haulage Executive now use interim conditions of carriage.

The position with regard to liability is similar to that laid down by the Railway Executive. There is, however, again the question of limit of liability.

Unless special arrangements are made, the Road Haulage Executive is prepared to accept liability only at the rate of £400 per ton of the gross weight of the consignment. If only part of the consignment is involved in a claim, the limit of liability is that proportion of £400 per ton of the gross weight which the part of the consignment involved bears to the whole of the consignment. There is a special clause in the interim conditions of carriage which indicates that this method of calculation of the limit of liability must not reduce the extent of the Road Haulage Executive's liability below the sum of £10 in respect of any one consignment.

Making a Claim

There are a number of points to which attention must be paid if claims are to be successful. It is always advisable for goods and their packing materials which are the subject of a complaint or claim to be retained for a reasonable

time to allow the carrier's representative to carry out an inspection. Probably the most important point regarding claims is the time limit within which complaints and claims must be lodged. With rail traffic the present position is that where there has been total loss of a whole consignment or a complete package or packages forming part of a consignment, the complaint must be made within 28 days and the claim within 42 days of the despatch of the merchandise. Food manufacturers will find that these times are in excess of those shown in the Statutory Conditions of Carriage, but they are the times operating at present.

Where there has been only partial loss, consisting of damage, pilferage, or deviation, the complaint must be made within three days and the claim within seven days of the termination of transit. Although there is provision made in the conditions of carriage for claims to be considered outside these periods, it will normally be possible to obtain settlement of such claims only if some special reason has prevented their being lodged within the proper period.

Complaints and claims must be made in writing and the endorsement of any of the Railway Executive's documents does not fulfil this requirement. They should also be sent to the district or head office of the Railway Executive or to the forwarding or receiving station. The same conditions apply to traffic conveyed by the Road Haulage Executive. Where traffic has obviously been the subject of damage or pilferage, this should be noted against the signature given for goods. Even where traffic is in apparent good order it is normally advisable for the signature to be qualified with some such remark as "unexamined."

(To be concluded)

Treatment of Sausage Casings with Lactic Acid

RAPID drying of fresh sausages resulting in the formation of a hard skin and retention of water at the centre of the mass can be prevented in cases where arrangements can be made for the maintenance of the appropriate humidity of the atmosphere, particularly during the initial drying stage. Where such facilities are not available, a good deal can be done to reduce the risk of spoilage by the use of casings pretreated with lactic acid, which gives the requisite degree of porosity.

The method was recently demonstrated in large scale laboratory tests at the Finnish Co-operative Slaughterhouses Research Institute (*Fleischwirtschaft*, February, 1953) in which the drying process was conducted in excessively dry air. The sausage mix was composed of 2,300 g. beef, 2,300 g. pork, and 1,850 g. bacon; the casings (the Czechoslovak "Cutisin" and the German "Transparit-D") were soaked for 30 minutes in 10 per cent. lactic acid solution. Control casings were similarly soaked in water.

The initial drying phase of the sausages extended over seven days at 18°C. with an atmospheric humidity of 60 to 70 per cent., and smoking was carried out under the same conditions for 12 days. Changes in temperature during smoking were followed with an auto-recording Lambrecht thermohydrograph.

Below are tabulated the weight losses of the test sausages cased in Cutisin in the course of 19 days; initial weights were 1,167 g. and for the control 1,044 g.

	Casing soaked in lactic acid per cent.	*Casing soaked in water per cent.*
Drying phase; wt. loss after: 1 day ..	2·3	2·1
2 days ..	5·5	4·5
3 ,, ..	8·3	6·6
5 ,, ..	12·8	9·8
7 ,, ..	15·3	11·5
Smoking phase; wt. loss after: 8 days ..	16·7	12·6
10 ,, ..	19·5	15·9
12 ,, ..	21·7	19·1
15 ,, ..	24·5	22·7
19 ,, ..	26·1	25·1

The superior porosity of the casings treated with lactic acid is demonstrated by the more rapid evaporation, although the difference is by no means spectacular. On the other hand the sausage cased in the acid-treated material had a most attractive surface and could be readily detached from the casing, whereas the control specimen had developed an extremely unappetising, wrinkled surface.

Bacteriological tests also emphasised the advantage of the lactic acid-treated casing; agar counts gave 24 to 64 colonies from the sausage cased in acid-treated material as against 600 to 800 colonies in the control sausage.

Devising New Meat Products

(Continued from page 187)

cording to its formulae; it works in conjunction with the plant laboratory and with the consumer research department on various problems.

During the course of preparation of a formula for a new product, samples are submitted to the taste panel or committee and may be changed many times before it is finally approved.

It is then submitted by the consumer research department, with a simple questionnaire, to certain groups of women all over the country, who sample it under ordinary home conditions. If the company then feels that the product has the approval of all sections of the public, the general test department prepares costings for its manufacture, so that the sales department can determine whether or not it would be an economic proposition.

The development laboratory is free to carry out research on any product, but because of its knowledge of consumer buying habits and changes in consumer preference, the canned food sales department often suggests products to develop or improve. Some recent developments of the laboratory are: ham à la king, beef stew, chop suey, spaghetti and meat, and chili con carne. In addition, it has developed some 40 or 50 others, some of which are entirely new products of the meat industry.

Beet Sugar History

WITH last season's bumper beet sugar harvest in mind, it is appropriate to commemorate the bicentenary of Francis Karl Achard, father of the industry. Achard has been much neglected by biographers of men who have created far less in the industrial field; so much so, that only the German literature gives full acknowledgment. Germany has every reason to pay tribute to this pioneer, for Achard came from a Protestant family driven out of France by the Revocation of the Edict of Nantes. So it was Germany who derived full benefit when this son of a Huguenot succeeded after years of struggle in extracting sugar from beet in the factory rather than in the laboratory.

Achard's Versatility

The laboratory preparation of beet sugar had been dabbled with ever since Oliver de Serres in 1590 wrote of beet being boiled with water to yield a sugar solution similar to cane sugar syrup. Since Achard was a pupil of Andreas Marggraf, it should be noted that this Berlin professor of chemistry began the story when he observed that Silesian beet contained from five to seven per cent. sugar, and followed this up by slicing, drying, and macerating it with alcohol to obtain a little sugar. But Marggraf was too busy with other chemistry and with attacks on laymen-chemists of his day: "The statesman, the barber, the army surgeon, yea even the company promoter (oh, sorry label!) are brazen enough to count themselves among the chemists." So it was left to Achard to become father of beet sugar, especially when Martin Heinrich Klaproth, Germany's most brilliant analyst of his day, also prepared some beet sugar in the laboratory and likewise turned to other subjects for study.

Francis Achard seems to have been a versatile student in his Berlin Academy days, although he chose the practical sciences rather than mathematics as his father had done before him. The son at the age of 20 had begun those writing activities which stood him in good stead in later years when publishing his classic studies on beet sugar. He studied and wrote on electricity, meteorology, alloys, precious stones, and a host of other topics, at times experimenting to test some points.

In 1789 he began his life's work in the cause of beet sugar, by small scale factory efforts at Caulsdorff near Berlin. He had tried other members of the vegetable kingdom; but in the second year of his researches he obtained very moderate yields of sugar from beet and therefore began to study improved cultivation and the effect of fertilisers.

A fire at his factory and the sale of his goodwill delayed matters; yet he continued the struggle, studying yields under different extraction procedures, and by 1796 he succeeded sufficiently to win royal support. Frederick the Great granted him £8,000, while Frederick William III of Prussia clinched the matter by backing full scale operations at Kunern, near Steinau in Silesia. His first efforts on an appreciable scale (for those days) produced six tons of sugar from a year's beet harvest, this costing 2s. 4d. per pound.

Beet Sugar Literature

Yet more acres were planted, and after six years' effort in increasing yields and utilising beet residues as cattle fodder Achard ensured a lead for Germany which France could not approach. Among his classic contributions to beet sugar literature were: "Directions for the Production of Sugar from Beet" (Berlin, 1800); "A Short Study of the Evidence for the Practical Manufacture on a Large Scale of Sugar from Beet" (Breslau, 1803); "The Influence of Beet Sugar on Economics" (1805); and "The European Beet Sugar Manufacture" (1812). Achard completed his success by establishing a school of sugar technology at Kunern.

Events since these historic days serve to show how, in contrast to the development of cane sugar, the beet sugar industry owes everything to one man. The French beet sugar industry, for example, grew up fully conscious that Germany held the lead because of the flight of Achard from France in an unenlightened era. In 1811 Napoleon had 70,000 acres of beet planted, and built the first French factory at Lille. The French Government appropriated at one period a million francs for furthering commercial production of beet sugar and had 40 small factories built.

Napoleon III was the most notable champion, publishing from the fortress of Ham (where he was prisoner while Prince Louis) a remarkable "Analysis of the Sugar Question." Although this emperor had failed to become a chemist while coached by pharmacist Acar in the Ham prison, although he has been dubbed a mountebank by many historians, credit should be given to his efforts to save France's beet sugar industry, this after the British blockade had been lifted and cane sugar was once more available from the Indies. On the mantelpiece of the study at St. Cloud the chief ornament was a cone of beet sugar, a reminder of a royal support. Yet 1885 summed up the rival industries of France and Germany, with the latter getting 12 per cent. extraction compared with only eight in France. France had to import superior beet seed from Germany.

While commemorating Achard's bicentenary it is appropriate to mention the centenary of Gwynne's patent for drying sliced beet in heated cylinders. The more recent De Vecchis process used slicing and drying of beet cossettes at 250°F., the claim being that albuminous matter coagulated at this temperature and became insoluble. In 1853 also came the patent of Needham and Kite covering the principle of the first filter press, a year in which Bessemer tried so hard to win success in sugar manufacture.

TO AUTHORS

FOOD MANUFACTURE is prepared to consider the publication of articles on the subjects covered. Books on food would also be considered.

News from the Industry

FORTHCOMING EVENTS

Society of Chemical Industry

The Microbiology Group of the Society of Chemical Industry will visit the National Institute for Research in Dairying, Shinfield, on Thursday, May 28.

The May meetings of the Agriculture Group are as follows:

May 1 and 2. "Potatoes as a Crop and an Industrial Raw Material," by Dr. W. Black, Mr. J. A. Radley, and Dr. R. N. Salaman. A joint meeting of the Food and Agriculture Groups and South-Western Section at Newton Abbot.

May 19. "The Colonial Agricultural Service," by Sir Geoffrey Clay at 2.15 p.m. at the Royal College of Science.

*

The Nutrition Society

The Nutrition Society is holding a two-day conference, in honour of the bicentenary of the publication of James Lind's "Treatise of the Scurvy," at Edinburgh on Friday and Saturday, May 22 and 23. After an opening ceremony in the University Upper Library, Surg. Vice-Admiral Sir Sheldon Dudley will give an address on Lind, and Sir Edward Mellanby will then take the chair at the first session of the Conference.

The following contributions have been arranged:

Dame Harriette Chick (Lister Institute, London). "Early Investigations of Scurvy and the Antiscorbutic Vitamin."

Dr. C. G. King (Nutrition Foundation, New York). "The Discovery and Chemistry of Ascorbic Acid."

Dr. M. van Eekelen (Utrecht, Holland). "The Occurrence of Vitamin C in Foods."

Prof. H. A. Krebs (Sheffield). "The Sheffield Experiment."

Prof. S. B. Wolbach (Harvard). "The Histology of Scurvy" (read by proxy).

Dr. J. H. Crandon (Boston). "Ascorbic Acid Deficiency in Human and Experimental Subjects."

Dr. R. M. Kark (Illinois). "Ascorbic Acid in Relation to Scurvy, A.C.T.H. and Surgery."

Prof. E. J. Bigwood and Dr. J. P. Dustin (Brussels). "Amino-aciduria in Infancy and Ascorbic Acid Deficiency."

Dr. C. P. Stewart (Edinburgh). "Dehydroascorbic Acid in Human Blood Plasma."

Dr. H. Gounelle and Dr. H. Teulon (Paris). "Contribution à l'étude de la Vitamine C dans certains états physiologiques et pathologiques chez l'homme."

Dr. L. W. Mapson and Dr. F. A. Isherwood (Cambridge). "Synthesis of Ascorbic Acid in Plants and Animals."

Dr. W. J. Darby (Vanderbilt University). "The Relationship of Ascorbic Acid to Tyrosine, Folic Acid, and Vitamin B_{12}."

The Royal Society of Arts

Included in the meetings for May is the following:

May 13. "Training for Science and Technology," by Sir Richard Southwell, joint general secretary, British Association for the Advancement of Science, with E. Munro Runtz, chairman of the Council of the Society, in the chair.

*

Royal Technical College, Glasgow

A summer course in the Science and Practice of Food Preservation is to be held in the Royal Technical College, Glasgow, from July 6 to July 11, under the direction of Prof. James P. Todd, Ph.D., Ph.C., F.R.I.C.

The course will survey available methods of food preservation and will discuss the concepts behind industrial processes as well as some of the practical applications of these concepts to the processes themselves. It will be an attempt to present an integrated picture of preservation processes and will be of interest to food chemists and food technologists who, it is hoped, will find new methods of approach to their own problems from the study of fields beyond their day-to-day concerns.

The fee for the course will be five guineas and applications should be addressed to the Secretary, Royal Technical College.

Erections and Extensions

Plans have been drawn up for Herring Industries Ltd. for the construction of a cold storage building as an extension to their premises at Whapload Road, Lowestoft.

*

Extensions are to be carried out by British Canners Ltd. to their factory at Bewell Street, Hereford.

*

A new storage building is being constructed by Tate and Lyle at Peruvian Wharf, Silvertown, E.16.

The Leonard Hill Technical Group

Articles published in some of our associate journals in the Leonard Hill Technical Group this month include:

Manufacturing Chemist.—New Antibiotics Factory in Sweden; *p*H and the Adaptation of Bacteria against Quaternaries.

Chemical & Process Engineering.—Review of Evaporation; Synthetic Liquid Fuel Plants.

World Crops.—Articles dealing with the natural rubber industry.

Agriculture Group Chairman

Mr. W. Leonard Hill, chairman of Leonard Hill Ltd., has been re-elected chairman of the Agriculture Group of the Society of Chemical Industry.

Society of Dairy Technology

Nearly 200 members of the Society of Dairy Technology visited Reading on March 24.

In recent years the dairy industry has changed in a most spectacular fashion, and both milk distribution and dairy products manufacture have become very complex, highly technical operations.

The Society, founded in the middle of the last war, on March 2, 1943, to encourage the development of dairy science, technology, and education, has, in the space of one decade, grown rapidly and is now the acknowledged expert body in this field.

Members spent the morning at the University Department of Dairying. This is the oldest dairy school in Britain and since it provides the only degree course in dairying in this country it has become the main centre of advanced teaching. The Department has been extended and re-equipped with a vast range of intricate scientific and technical apparatus and machines which will enable any dairy process to be carried out.

The wide range of equipment is almost unique, and Prof. E. L. Crossley described the new developments in dairy teaching methods and research into the problems of dairy processing. He pointed out that the possibilities of a professional scientific or managerial career in this field were still largely unknown and appealed in particular for a larger inflow of men.

The afternoon was spent at Shinfield, at the National Institute for Research in Dairying, which is closely associated with the University. Since its foundation in 1912, this Institute has become the largest centre in this country for dairy research and has now an international reputation. While at the N.I.R.D. members visited five of the research departments and also took part in a discussion on sterilised milk, in which field considerable interest is being shown.

Machinery Price Reduced

All models of the Victor Adding-Listing machine, manufactured by Block and Anderson, have been reduced in price from £75 to £58 10s. plus £4 for carrying case.

Formation of Joint Technical Committee

LIAISON BETWEEN MANUFACTURERS

It has been felt in many quarters that considerable benefits would arise from closer collaboration between food manufacturers and food machinery manufacturers. Several of the productivity reports published by teams representing particular sections of the food manufacturing industry, which have recently visited the United States of America, have also recommended such closer liaison.

It is now announced that following an approach by the Food Manufacturers' Federation Incorporated to the Food Machinery Association, a special Committee to be known as the Joint Technical Committee (F.M.F./F.M.A.) has been appointed with the following Terms of Reference:

A. The objects of the Committee are:

(i) To secure close liaison between food machinery manufacturers, food manufacturers, and technical organisations, and thereby

(ii) to improve the performance, range, and types of British food machinery as a further aid in improving the quality and productivity of British food manufacture.

B. To achieve these objects the Committee will meet frequently for the following purposes:

(i) to examine what present means of liaison exist and what other committees or organisations could assist or should be kept informed of the Joint Technical Committee's work and to continue to accept help from, or give help to such committees or organisations;

(ii) to consider foreign machinery of special merit and to make recommendations of the means whereby the British manufacturer can obtain comparable results;

(iii) to investigate the field of food machinery of foreign origin and in this connexion to consider problems of import and also to have regard to the recommendations of the various Teams and individuals who have visited or may visit the U.S.A. or other countries;

(iv) to disseminate knowledge of British food machinery throughout the food manufacturing industry and similarly to keep machinery manufacturers informed of the performance of existing machines and of future requirements;

(v) to encourage a higher standard of mechanisation in the food manufacturing industry;

(vi) to examine the individual problems of manufacturers which may be brought to the attention of the Committee by the Parent Bodies.

C. To keep the Parent Bodies informed of the work of the Committee and to make recommendations.

In addition to representation from the Food Manufacturers' Federation and the Food Machinery Association, other interested bodies such as the British Food Manufacturing Industries Research Association and the D.S.I.R. Food Investigation Organisation have been invited to be represented upon the Committee.

As one of its first tasks, the Committee will proceed to review the machinery and mechanical aids to which attention has been drawn in the various food productivity reports.

Pest Control

Developed in America and produced under licence in England, the mechanical fog generator Microsol, which is based on the principle of the spinning disc, is being widely adopted by industry. It has all the features required for effective pest control. Being mechanical it requires no heat, steam, or pressure and has a variable particle size controlled by the operation of a small lever. No special attachments are required on the machine, which weighs only 12 lb.

Because of its mechanical nature, it does not rely on small holes to create a fine particle size and this consequently offsets chances of clogging. The fine spray is caused by spreading material over the spinning disc which revolves at 16,000 r.p.m. worked in conjunction with a fan that breaks off particles of the size required by the operator. The small model will air-spray an area of 20,000 cubic feet in a matter of a few seconds; surface applications for persistent effect can also be made. There is no decomposition of insecticide as it passes through the machine as no heat is generated.

Since the marketing of Microsol began six months ago over 400 installations have been made in Britain. Most of these installations have been made in food packing, manufacturing, and storage plants where the saving of time and labour is an important factor. The success of the machine in Britain is confirmation of its success in America where over 35,000 machines are in use. At present, a considerable amount of research is being carried out with this type of equipment; its uses in the field of food manufacture are extensive and may be an important factor in pest and disease prevention.

Emulsifier for the Food Industry

Manufactured in Australia under strictly hygienic conditions, Smoothex, a refined self-emulsifying glyceryl monostearate, is available from W. J. Bush and Co.

Red, White, and Blue Cake

A wide range of special Coronation cakes, produced by the CBC Service Bakery of Craigmillar and British Creameries for the baking and catering trades, was shown at a recent demonstration at Sussex House.

Of particular interest was the cake made from red, white, and blue batters. An unusual Crown design shortbread was also shown in which the Crown stood out in clear relief by the use of a special shortbread paste and of a Coronation motif stencil.

The stencil, now available to the trade, is made from non-inflammable plastic in either red, white, or blue. It carries two sizes of the Crown motif. Designed by a member of the CBC staff, using for the prototype a fret-saw and an ordinary dough-scraper, the stencil can be quickly and safely cleaned by using hand-warm water and wiped dry on a flat surface.

Colour is added to the embossed crown.
Photo Leonard Hill Ltd.

Food from Denmark

Dolls dressed in authentic folk costume illustrated Denmark's new cheese names at the Ideal Home Exhibition. The main theme of this stand, occupied by the Danish Agricultural Producers, was Denmark's contribution to the British larder, figures showing that the country supplies about 71 per cent. of all imported bacon, 78 per cent. of all imported eggs, 34 per cent. of imported butter, and 40 per cent. of imported cheese. Another feature of this stand was the cheese ballot. Visitors were asked to vote on young Samsoe cheese (eight to 10 weeks) and old Samsoe (20 weeks), saying which they liked best for flavour, thus enabling the Danish cheese industry to supply exactly the type required.

Trucks for Drums

Specially designed for easy handling of large open ended drums, barrels, bins, tubs, and vats, the Powell Glyda-Truck can also be used for bales, mail bags, cartons, and cases. The space between the two handles is unrestricted so that the operator can lean over the drum during filling operations. The centre of gravity of the load is so placed that smooth transport is assured both for the two-wheeled and the three-wheeled models. During transport, the drum is quite upright and "swishing" of liquid contents is negligible. A safety hook which drops down over the top edge of the drum is provided on all models.

Owing to the low loading platform, the amount of tilting during loading is very small. The use of this truck enables one man to move up to 6 cwt. over flat ground.

A Pioneer of Infestation Control

A luncheon in honour of Mr. McAuley Gracie was held at the Savoy Hotel on March 25, the Rt. Hon. Philip Noel-Baker, M.P., taking the chair. Mr. Gracie recently retired from his post as Director of and Adviser on Infestation Control, to which he was appointed on its inception with the Ministry of Food in 1941 (since 1947 in the Ministry of Agriculture and Fisheries). His invaluable services are not to be lost to industry and the public. As consultant he has now joined the Board of Mr. H. G. Anker-Petersen's Group of Infestation Companies.

Mr. Gracie is a pioneer of infestation and his profound knowledge has made him one of the foremost authorities in the world. He has since 1936 led an unrelenting war against the pests destroying and fouling our food and undermining our buildings. He originally led a representative industrial movement for focusing the attention of the Government, industry, and the general public on the damage to food stocks and the menace to health created by the then deep-seated infestation by rats, mice, and insects—a horror being daily reinforced by infested goods from abroad.

With Government acceptance of principles, a first step was made when, with financial support from industry raised by Mr. Gracie, the Department of Scientific and Industrial Research established the Pest Infestation Research Laboratory at Slough. In its early days the new laboratory was greatly helped by the knowledge developed in the Imperial College of Science and Technology under Professor I. W. Munro, D.Sc., members of whose staff formed the original cadre on which the present organisation of the laboratory has been built.

The outbreak of the war brought the dangers of infestation to a number one priority and to ensure that the nation was fed, the Ministry of Food created the organisation, with Mr. Gracie at its head, to maintain the storage of food reserves and combat the destructive pests.

During his career as Director, Mr. Gracie fulfilled many missions and tasks for the Colonial Office, the Control Commission in Germany, UNRRA, the Emergency Economic Committee for Europe and FAO. For several years he was chairman of the European Infestation Control Working Party. He did for Berlin and the Four Powers in control what the Pied Piper did for a less important town centuries ago and dealt, for the then existing government, with the scourge menacing Taranto. In short, he has given the benefit of his zeal and knowledge to the world.

New Luncheon Meat

As a result of experiments carried out by the Oppenheimer Casing Co., a new luncheon meat has been evolved which is practicable with current meat supplies and which makes possible the use of up to 15 per cent. mutton in its production.

This new meat product, known as Smeat, is cured and cooked with the aim of giving maximum shelf life, particularly in the summer.

New Glasgow Offices

New offices have been opened by Dexion at 20, Renfrew Street, Glasgow.

Good News for Cheese Lovers

NEW YORKSHIRE CREAMERY

The official opening took place in March of a new creamery at Hawes, in the North Riding of Yorkshire. The main purpose behind this venture is the manufacture of Wensleydale cheese, although the creamery will also be equipped to handle liquid milk for onward despatch to consuming centres in Yorkshire. This will be encouraging news for all those who esteem this world-renowned cheese which, before the war, was equally popular with users of the large Atlantic liners and the pitmen of the Durham coalfields.

At the opening ceremony, Mr. R. A. Pepperall, Secretary of the Milk Marketing Board, recalled the time, some years ago, when those concerned with a small creamery making Wensleydale cheese found themselves in financial difficulties and a meeting of the local farmers was called to discuss the winding up of the business. Because they wished to save the industry from extinction, promises were made to find the modest amount of capital necessary to acquire the equipment and other assets that had passed into the possession of the Board.

Under the guidance of Mr. T. C. Calvert, a young farmer of vision and with enthusiasm for the Dales and the maintenance of the Dales industries, they ultimately succeeded in raising the necessary capital. Fortunately for them and for the Wensleydale cheese industry this young man possessed considerable business acumen and under his guidance the factory re-started in a modest way.

The next step was to improve the arrangements for the sale of Wensleydale cheese; the Milk Marketing Board was able to help by effecting a complete re-organisation of the industry and by enlisting the co-operation of the farmhouse cheesemakers and the cheese factors for this purpose. Today the position and prospects of the Wensleydale cheese industry are better than at any time in the hundreds of years since the monks of the local Abbeys of Jervaulx, Kirkstall, Fountains, and Bolton made the first Wensleydale cheese.

The man behind the new venture has designed the factory himself, using local material to preserve the beauty of the surrounding countryside. On the practical side, he has performed a great service by safeguarding the position of his fellow farmers who supply the factory with milk produced on land of limestone formation, which gives to the cheese its distinctive characteristics.

Conference on Tinplate

PREPARATIONS FOR BRITISH STANDARD ARE MADE

For some time now there has been a growing desire for a British Standard for tinplate. The first discussions on the subject took place at the outbreak of the 1939-45 war. A draft specification was prepared but the shortage of tinplate and other factors made the issue of a British Standard undesirable.

The question was again discussed in 1945 when the tinplate industry had just commenced a major reorganisation which would take some time to complete. It was therefore decided to defer action and to reopen discussions at a later date.

Now that the reorganisation of the tinplate industry is well advanced, tinplate users feel that, with the removal of the statutory controls on its use, positive action can be taken in the preparation of a standard.

Recently the industry's need for a standard was expressed in the form of formal requests from the Ministry of Supply and from the British Tin Box Manufacturers' Federation that the discussions which had been deferred in 1945 should again be reopened. In consequence of this a conference was held on February 17 under the aegis of the British Standards Institution.

The conference was attended by representatives of the British Tin Box Manufacturers' Federation, the Ministry of Supply, the Board of Trade, the British Iron and Steel Federation, and the Tinplate Conference (tinplate producers). In addition, there were representatives from the British Closure Manufacturers' Association, the Association of Steel Drum Manufacturers, the British Toy Manufacturers' Association, the oil companies, and other organisations concerned with the use and manufacture of tinplate. Mr. John Ryan (chairman of the B.S.I.) took the chair at the conference.

The users stressed the importance of reducing wastage which resulted from faulty material and the need for greater accuracy in manufacture. The tin box manufacturers emphasised particularly the need to increase manufacturing speeds and to improve the accuracy of their products in order to meet the canners' requirements for increases in canning speeds. It was argued that these increases and improvements could only be obtained by the supply of satisfactory tinplate, and that it was therefore necessary that generally recognised standards should be drawn up. The packaging of tinplate was also regarded as being an aspect that would need to be given careful consideration as present practice was often below a satisfactory standard. One important point made was that a satisfactory increase in canning speeds would be equivalent to the opening of a new canning plant.

The representatives of the tinplate industry pointed out that although the reorganisation of the industry has made considerable advances, some time must elapse before it could be complete.

The conference decided, however, that the machinery for the preparation of a British Standard should be set in motion without delay, it being appreciated that it would necessarily take some time before it would be ready for publication; it was hoped that by then the reorganisation of the tinplate industry would be such that it would be possible to implement the requirements of the standard to the satisfaction of all parties.

Long-service Record

The first anniversary dinner of the Twenty-five Year Club of the Pressed Steel Company was held recently in the ballroom of the factory at Cowley. Members of the Club consist of directors, executives, and works and office employees who have been in the company's service for an uninterrupted period of at least 25 years. When the inaugural dinner was held a year ago no fewer than 91 persons qualified as founder members, and were presented with Club membership badges and gold watches by the chairman of the company, Major Albert Pam, O.B.E., M.A., himself a founder member.

At the first anniversary dinner a total of 139 additional persons qualified for membership and were presented with badges and gold watches.

Autopack World Tour

Travelling to New Zealand for the purpose of supervising the installation of a number of automatic packaging plants, Mr. Geoffrey Tapperell, technical representative of Autopack Ltd., during his visit, will be advising the firm's agents on various special problems on which they require information for their customers.

On his return journey, Mr. Tapperell will also carry out similar service in Australia and India. While in those countries Mr. Tapperell would be very happy to call and give on the spot advice to any company concerned with or interested in the use of automatic weighing and packaging plants, for the food, pharmaceutical, and chemical industries.

OBITUARY

Mr. B. Randall, Governing Director of T. Randall and Co. on February 20, 1953.

His whole life had been spent in the business which was established by his father, Thomas Randall, and he was highly respected in the confectionery trade.

▪

Francis William Lewis, a director of A. Boake, Roberts and Company, on March 15, 1953, after almost 60 years' service with the company.

It was under his guidance that the company commenced the manufacture of Fine Chemicals and he was intimately concerned in the development of the business until the onset of his illness last November.

Sales Conference and Party

The annual two-day conference of the scientific, administrative, and technical staff of the Colt Associated Companies took place recently at the Ace of Spades' Club, Surbiton.

After the conference, the whole of the staff, and representatives from Air Control Equipment Pty., the Australian agents for Colt Ventilation, and from Bunge (Australia), the Australian agents for Colterro Clay Lath, were entertained to a party by the chairman and managing director, Mr. I. J. O'Hea, F.C.I.C.

This 1953 conference marks the inauguration of the Colterro Clay Lath Sales Division. The directors have appointed Mr. Norman P. Slade as sales manager of this division, which, for the time being, will operate from the company's head office at Surbiton.

Mr. W. A. Barker of Walton-on-Thames wins the Wall's challenge cup by taking first prize in a bacon pig carcass competition.

New Designs for Food Products

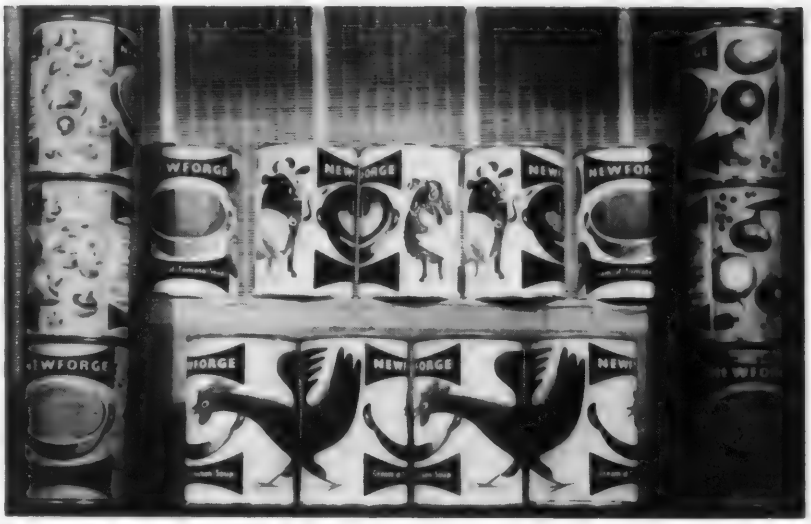
New designs have just been released by Newforge Ltd. for their complete range of food products.

Each category has been allocated a constant background colour for easy recognition (light blue for soups, green for vegetables, tea rose yellow for meat, and white for fruits). Each of these categories has been subdivided into individual label designs for all standard production lines (all similar in basic conception but showing a full colour illustration of the contents) and "blank" label designs for short run productions for mainly special or seasonal foods, which would have to be imprinted at short notice.

For all food illustrations the designers, W. M. de Majo and F. H. K. Henrion, created a near realistic style and in order to achieve the maximum effect, colour transparencies were made of each product and the artwork prepared from this.

For meat products (soups and solids alike) a humorous touch was introduced which ensures variety and gaiety in the range of Newforge products and gives maximum sales appeal and recognition value.

The use of the can as a composite unit where two or more cans can be put together side by side to form a continuous picture—as in the case of the chicken soup and meat labels—is an entirely new conception in can packaging and design. Not only do the animals join up from can to can but so does the lettering and two soup bowls and the logotype when placed against each other; all combine in a way which creates new display appeal.



Cans used as composite units to form a continuous picture.

Materials Handling in Industry

Manufacturers are realising that the handling and movement of materials represent quite a high proportion of total production costs. The use of electric battery trucks for this purpose has many advantages, among which are considerable saving in production costs, the absence of fumes, silence, instant starting and stopping, and manoeuvrability. Ransomes have been building such trucks to suit differing problems for 35 years and their present range includes those with fixed or elevating platforms from one to four tons capacity, crane trucks, tipping trucks, tiering trucks, forklift trucks, and electric tractors.

The company's range of forklifts includes trucks of 10 to 40 cwt. capacity, adaptable for use with varying types of load. Two-ton platform trucks are also available with fixed or elevating platform, side tipping hopper or end tipping body types, and crane trucks suitable for heavy single pieces or loading or unloading barrels and sacks from railway waggons or lorries. The company have also developed a tiering truck with elevating platform which is invaluable in cases where goods have to be loaded at different levels.

In addition to the above, electric tractors are supplied in 20 to 30 cwt. and six-ton capacities. The 20 to 30 cwt. will haul at approximately six miles per hour and the six-ton type at approximately three to three and a half miles per hour on level routes.

Biological Methods Group

At the eighth annual general meeting of the Biological Methods Group of the Society of Public Analysts and Other Analytical Chemists, the following were elected Officers of the Group for the ensuing year:

Chairman: Dr. H. O. J. Collier.
Vice-Chairman: Dr. L. J. Harris, F.R.I.C.
Hon. Secretary and Treasurer: Mr. S. A. Price, B.Sc.

Changes of Address

The head office of Rubber Improvement is now at Rilex Works, London Road, Wellingborough, Northants. (Telephone: Wellingborough 2218. Telegrams: Rilex, Wellingborough).

▪

The Institute of Export offices are now at Export House, 14, Hallam Street, London, W.1 (Telephone: MUSeum 6761).

▪

The Head Office of the Energen Foods Co. has been transferred to Pound Lane, Willesden, London, N.W.10 (Telephone: WILlesden 3771).

As all production is now concentrated at the firm's Ashford (Kent) factory, the address for suppliers' inwards deliveries, customers' returns of goods damaged in transit, etc., is now Energen Works, Birling Road, Ashford, Kent (Telephone: Ashford (Kent) 1180).

The Ransome forklift electric truck at work. *Photo H. J. Heinz.*

APPOINTMENTS AND RETIREMENTS

The Scottish representative of Dawson Bros. is Mr. A. Guinan, 110, Silverknowes Road, Davidsons Mains, Edinburgh, 4.

■

Dr. D. W. Kent-Jones, chairman of Procea Products, and consultant in cereal chemistry, has been appointed President of the Society of Public Analysts and Other Analytical Chemists.

■

Mr. C. A. J. Martin, G.C., M.C., B.A., A.M.I.E.E., general sales manager of the Plant Division Home Sales, Mr. M. H. L. Lewis, M.A. (Oxon.), assistant to the works director (South), and Mr. Michael Parkinson, M.A. (Cantab.), assistant to the works director (North) have been co-opted to the Board of Executive Directors of Crompton Parkinson for a period of one year.

■

Mr. Leslie J. Davies has retired from the post of assistant managing director of Richard Thomas and Baldwins. He will, however, remain on the Board of the company.

He has been succeeded by Mr. G. A. Young (general manager, Ebbw Vale Section). Mr. Young has also been appointed a director of The Steel Company of Wales.

Mr. Charles G. Gilbertson has retired from the Board of Richard Thomas and Baldwins because of ill health.

■

Mr. W. M. Hood, a managing director of Cadbury Bros., who joined the firm in 1919, has retired. He was one of the first three members of the staff appointed to the Board and his chief responsibilities were connected with the Buying Department, Cadbury's milk factories, and extensive cocoa activities both on the Gold Coast and in other parts of the world.

Mr. Hood's first responsibility at Bournville was the buying of timber, after which he took over the purchase of sugar and milk. In 1938 he became head of the joint Cadbury-Fry Buying Organisation.

Well known throughout the industry for the leading part he played in the milk producing and distributing trade, Mr. Hood was Director of Milk at the Ministry of Food from 1941 to 1943.

Even better known for his work in connexion with the production of raw cocoa, he served on committees of the Cocoa, Chocolate and Confectionery Alliance and many other bodies. Research into swollen shoot disease, new strains, and new planting areas gave him an expert knowledge of cocoa-growing problems.

Mr. Hood remains a director of the British Cocoa and Chocolate Company.

OBITER DICTA

● The English are a great and hardy people because they eat their own cooking and survive it; they have become inured to suffering.—"*Daily Mail.*"

● Never before has the land of England been farmed by so few hands on such a small area for so little return.—*Mr. G. H. Tawell, member of the N.F.U.*

● Let food shops be food shops rather than general stores for everything, regardless of the demands of hygiene.—*Senior sanitary inspector for Batley (Yorks.)*

● It is unwise to ask a sausage-maker about his seasoning; it is one of his most jealous trade secrets. From now on that should be the only mystery about a sausage.—"*Daily Dispatch.*"

● One can visualise in a future epoch a race of people being born without teeth—the latter not being required as that race will only eat "soft" foods.—*Letter to "Picture Post."*

● It has been said that middle age is when you start eating what is good for you instead of what you like; the pithy answer to that is contained in the terse American phrase: "Be your age."—"*Milling.*"

● Ministers come and Ministers go, but I suspect that of all Ministers, I am the one whose departure would be greeted with the greatest glee.—*Major Lloyd-George, Minister of Food, in a B.B.C. broadcast.*

● Breakfast is not normally a meal at which most people are at their brightest; can it then be seriously asserted that a steep rise in the cost of breakfast food is calculated to bring brightness to a meal which in so many households resembles a funeral feast?—"*Reynolds News.*"

● We have for a long time thought of the Minister of Food as some knavish Puck who rendered bootless the labours of the poor housewife; now his character is altogether changed and he becomes as the friendly cow in *A Child's Garden of Verses:*

"She gives me cream with all her might
To eat with apple tart."—"*The Times.*"

BOOKLETS RECEIVED

The application of refrigeration in the catering industry is the subject of a recent brochure issued by York Shipley.

■

A new booklet entitled "Rotary Dryers and Coolers" has been published by the Sturtevant Engineering Co.

■

The first edition of a pictorial news sheet dealing with the instruments, employees, dealers, agents, and clients of the company has been issued by Evershed and Vignoles.

■

A scientific survey of the process of labelling by the use of liquid adhesives, non-curling gummed paper, Heatfix papers, and pressure sensitive label papers has been published by Samuel Jones and Co.

■

Three booklets have recently been issued by APV. These relate to the Stockton and Radstock Co-operative Dairies and the wide range of milk tanks manufactured by the company.

■

Two brochures have recently been issued by Teleflex Products. One deals with the ·705 in. overhead cable conveyor, and the other with industrial remote control equipment.

■

The fourth edition of "Laboratory Chemicals and Reagents" issued by May and Baker is now available. This useful reference book, which sets out the entire range together with full details on individual specifications, has been completely revised, and now lists for the first time the specifications of 16 recent additions. In all, there are over 500 different chemicals, selected to serve a wide variety of procedures in general laboratory practice.

■

When the Manufactured Meat Products Working Party was appointed by the Ministry of Food, the Food Manufacturers' Federation submitted detailed evidence for its consideration and one of the suggestions which was then made was that some recommendations on hygiene should voluntarily be prepared for the guidance of the trade.

In a recently published report, the Meat Hygiene Committee of the Federation have included recommendations and notes on standards of hygiene in meat products factories which will prove of value in tackling the many complex problems which have to be overcome if improvement in methods of handling and processing is to be maintained throughout the industry.

Sales of Tar Acid Products

As good progress has been made with the building of a tar acids refinery at Four Ashes, near Wolverhampton, The Midland Tar Distillers will take over from Monsanto Chemicals the selling and sales service of:

(*a*) Ortho-cresol and all grades of cresylic acid as from April 1, 1953.
(*b*) Natural phenol on July 1, 1953.

A New Birmingham Office

A branch office opened in Birmingham by Honeywell-Brown will serve customers in an area extending from Derby, southwards to Oxford, and will be the headquarters of sales and service personnel dealing with the company's entire range of instruments manufactured at their Blantyre works in Scotland.

The address of the new office is 67, Exchange Buildings, Stephenson Place, Birmingham 2 (Telephone: MID 0857).

Canning and Packing Facilities

During certain off-seasons, facilities for canning and for producing either fully prepacked (under customer's labels) or concentrated bulk materials, such as dry mix mincemeat and sweetened fat, are available at the modern Dublin plant of P. Kavanagh and Sons.

Food Ticket Production

Specialising in supplying showcard and ticket equipment to enable those engaged in food manufacture to produce their own advertising cards, plastics, tickets, etc., at low cost, Hill Bros. (Service) have long been personally associated with catering and food manufacture. A complete range of equipment to suit concerns of different sizes, from the small grocers to the large combines, is available.

Much of the success of this concern is due to the fact that it is under the personal supervision of the two brothers themselves. Mr. Charles Hill devotes special attention to concerns needing advice on suitable equipment, his experience enabling him to select and advise on the machinery suitable for food ticket production.

Propylene Glycol

Propylene glycol is now being manufactured in commercial quantities for the first time in Great Britain, or in Europe. This news will be of particular interest to manufacturers of essences for foodstuffs and to manufacturing chemists and many glycerine users.

Until now, the propylene glycol available in the U.K. has been of American, and to a lesser extent, Canadian origin, but owing to the scarcity of dollars, imports have been restricted.

Technical, foodstuffs, and B.P.C. grades of propylene glycol can now be supplied in quantity. Full information may be obtained from the manufacturers, Petrochemicals Ltd.

Food Equipment at the B.I.F.

BIRMINGHAM

Barrier Creams

Year after year, factory inspectors' reports show that, of all the occupational diseases that are continually sapping the strength of the country's labour force, dermatitis easily heads the list. Research on this problem has been conducted over the last 25 years by Rozalex who are now in a position to provide a preparation that will guard against most of the known causative agents of dermatitis.

Two types of barrier cream, for dry and wet jobs, will be shown by the company on stand D.706, together with the Rex dispenser which has been designed to provide an economical and uncontaminated supply of Rozalex to workers in factories and workshops whenever required.

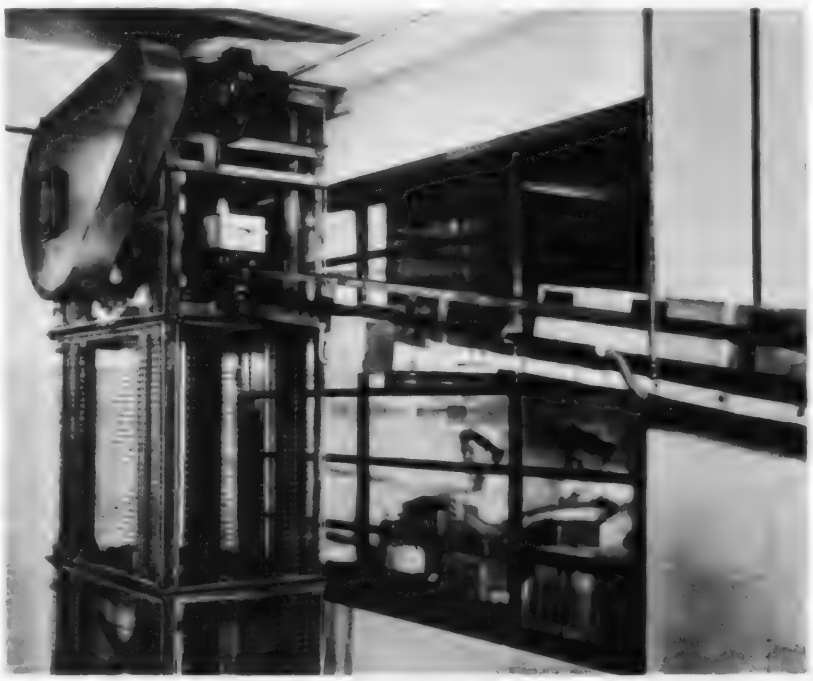
Flooring and Mechanical Handling

A special design of finger tray elevator has been introduced into their conveyor circuit this year by J. Collis and Sons. The VertiVeyor is a sectionalised form of elevator fitted with an automatic interruptor mechanism to ensure synchronised feed and automatic discharge grid. The equipment, which will be shown on stands D.625 and 324, is in the form of an arch which emphasises the flexibility of design. Also on view will be a new model of the Loda-Veyor with a hardwood slat carrying medium, all types of the Rola-Veyor and MotaVeyor, the Slat-Veyor, and Power-RolaVeyor.

A very comprehensive range of models of the Collis truck and stacker is also to be exhibited.

■

The major part of outside stand 1318, occupied by Fisher and Ludlow, will be devoted to a working exhibition of conveyors, together with a full range of products in the material handling equipment field, including pallets, flooring systems, mobile and box storage systems, and unit construction partitioning. On show for the first time will be Flowforge electro-forged open steel flooring.



The Collis VertiVeyor, a sectionalised form of elevator fitted with an automatic interruptor mechanism to ensure synchronised feed and automatic discharge grid, in operation.

A dough room floor of Stelcon anchor steel plates.
Photo The Coombe Bakery (Teddington), Ltd.

As in previous years, the floor of the Stelcon (Industrial Floors) stand (D.423) will be formed with anchor steel plates which have been widely used both at home and abroad in many types of factory. The structure of this stand will also incorporate storage wall units. The use of these walls provides a solution to the problem of storing loose bulk materials and they have a wide range of applications in many industries. Made of reinforced concrete, they are self-supporting and can retain loads against either or both sides simultaneously or separately.

Grinding Machinery

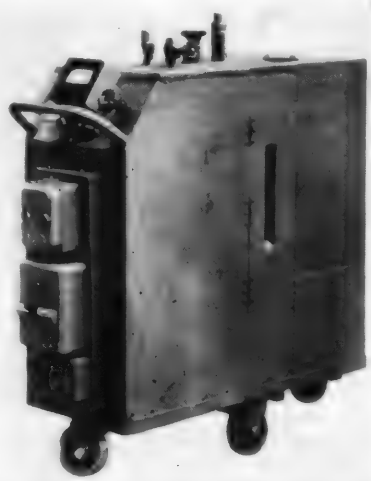
A new fine grinder which can be completely and speedily dismantled, cleaned, and re-assembled without the use of spanners will be exhibited on stand D.528 by British Jeffrey-Diamond. This machine, the intermediate Atomill, is the latest addition to the firm's range of fine grinders and has a product range from 50 to −300 B.S. mesh. Other features include an automatic non-choking device, built-in safety guard for hand feeding, and an overall enamelled steel cover which provides a guard for the mill, motor, and V-rope.

This machine will have special appeal to batch producers where it may be necessary to pass a variety of materials through the mill daily, and where speed and cleanliness are important factors when changing from one product to the next.

Other exhibits will include a crusher, a single roll breaker, a swing hammer pulveriser, a fine grinder, and the Microid Atomill.

Industrial Plant

A wide selection of boilers and other industrial equipment is to be shown by Bastian and Allen on stand C.711. An electrode steam boiler will be in operation to illustrate the controls of this type of equipment; a standard steam boiler will be in use with more elaborate controls; an electrode hot water boiler suitable for space heating and thermal storage plant will be on show; a steam jet cleaner rated at 20 kW will be shown, together with a vapour phase unit used for high temperature cooling and waste heat recovery from internal combustion engines, and an industrial oil heater suitable for high pressure and high temperature oil heating which could be used for pre-heating or boosting oil temperatures. This latter type of equipment can also be used for heat transfer of fluids for heating at temperatures up to 600°F. with pressures below 15 lb. p.s.i. where steam would be impracticable because of the high pressure required.



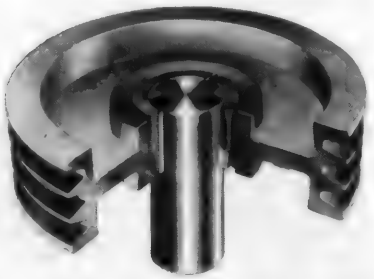
The B. & A. Speedylectric mobile steam jet cleaner rated at 20 or 40 kW for steam cleaning in industry.

*

Among the exhibits in the Engineering Section shown on stand D.537 by W. P. Butterfield will be a stainless steel still, a yeast collecting vessel, and a vacuum test chamber. The company also have a stand in the Hardware Section (A.314).

*

A gas immersion heated tank which can be used for a variety of processes in the food and metallurgical industries will be shown by the Dowson and Mason Gas Plant Co. on the stand of the Gas Council (Stands D.641 and 340).



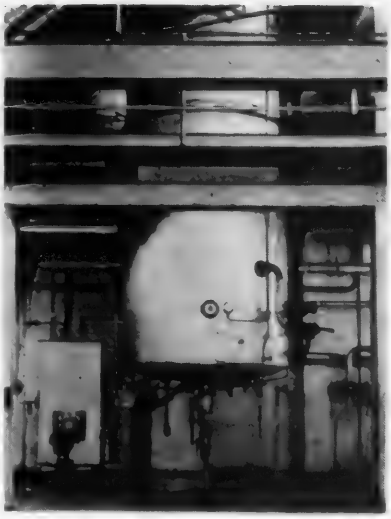
A cut-away illustration of the Fenner taper-lock bush, made under British Patent No. 595,912.

Prominent among the exhibits of J. H. Fenner and Co. on stand D.406 will be the new V-belts with filament rayon cords giving greater tensile strength, a higher modulus and flex, and more resilience. The new length coding system which enables V-belts to be selected to run as matched sets will be demonstrated. Also displayed is the new taper-lock pulley with $\frac{7}{8}$ in. wide grooves.

Further features will be the P.V.C. flame resistant conveyor belting, available in widths up to and including 30 in. Subsidiary displays will show the Hainsworth variable speed V-belt drives, Platt clutches of four different types, and the standard range of leather and textile float beltings.

*

The Rotocooler, which is capable of handling oils and fats, petroleum products, waxes, starch suspensions, gums, and mixtures for the manufacture of marshmallow, salad creams, and cake batters, will be exhibited by Food Machines (Slough) on stand D.157. The standard plant

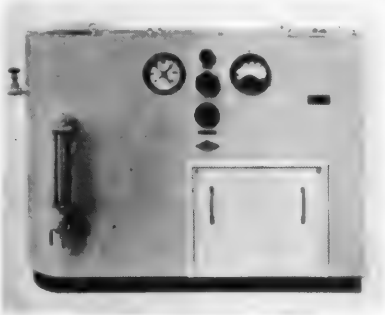


A Brussels oil refinery installation by Food Machines (Slough).

processes material at the rate of one ton to five tons per hour, but adaptations of the plant can be produced to give smaller quantities when required. A model of an edible oil refinery installation will also be shown, together with models of pumps, specially designed for the food industry, and examples of cocks and valves. The company design, manufacture, and erect all types of plant for edible oil refining from the crude to the finished product.

*

A range of Autolec electrode steam raisers and water boilers is to be displayed on stand C.321 by G.W.B. Electric Furnaces, together with a flow diagram illustrating the application of an electrode water boiler to a thermal storage system. The installation consists of a boiler together with ancillary switchgear, pumps, and storage tanks, the latter being filled with hot water during the off-peak hours for use in the daytime for space and process heating. This involves no extra load on the normal electricity supply used during working hours and saves the necessity of laying further cables for delivery of that extra load.

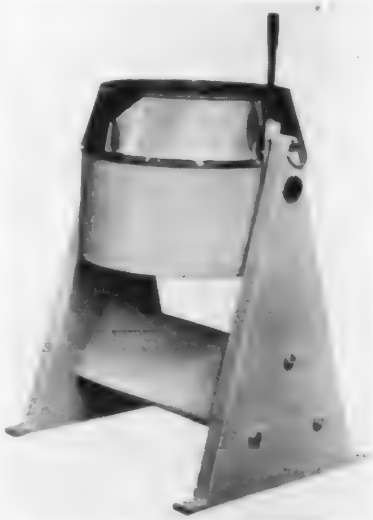


A 30 kW Autolec electrode steam raiser.

On stand C.213 will be shown the Handy-Andy warm air towels, manufactured by Quiz Electrics. The use of this equipment cuts out laundry bills, towel pilferage, and the cost of paper towels, while meeting the demands of Section 42 of the Factory Acts. Hands are dried thoroughly and quickly, the special septic pad further ensuring that all users are immune from contagion. The company also supply a combined hand and face drying model. The warm air from the face drier can be shut off if not required by a shutter plate operated by the lever on the face attachment.

*

Several examples from their range of jacketed stainless steel pans, including a 25 gallon steam jacketed tilting pan, with retractable slow speed stirrer gear, are to be featured by The Taylor Rustless Fittings Co. on stand D.312. The latest development in this line is a stainless steel pan heated by means of a Stabilag electric jacket which promotes rapid heating and accuracy of control. The upper heating circuits in the jacket can be switched off when the pan is being used only partly filled. It is also possible to construct a pan to work at temperatures that are too high for economic steam heating.



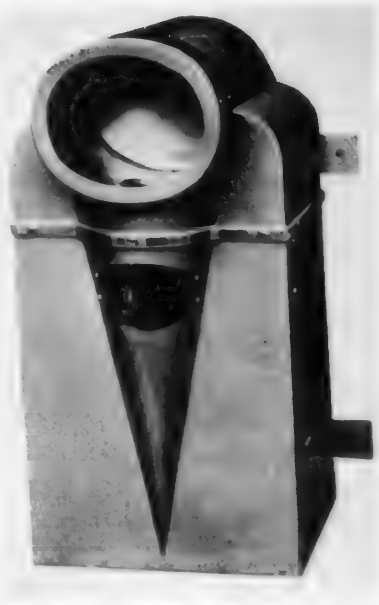
An electrically heated tilting pan.

Another exhibit will be a 15 gallon tilting pan together with other examples of stainless steel pipe manipulation and miscellaneous chemical plant.

Magnetic Equipment

Both permanent and electro magnetic separators will be exhibited by Rapid Magnetic Machines on stand C.421, among which will be the new electro magnetic vibratory chute type separator, designed to treat fine powders and other commodities of a similar consistency that require mechanical motion to precipate their flow. Some of the many forms of smaller chute type separators incorporating Alnico or Alcomax permanent magnets will be on show; these meet the requirements of those industries who encounter tramp iron in processing or in the final product. Also on display will be Magna humps and Magnatraps for inclusion in gravity, pneumatic, or hydraulic ducts, pipelines, etc., for use where tramp iron is to be removed from liquid, semi-liquid, or dry fibrous products.

Samples from the standard range of permanent and electro magnetic pulley and drum type separators will be exhibited, including an electro suspension magnet, for use over conveyors for the extraction of tramp iron from material prior to processing.



Handy-Andy warm air towel.

The Rapid vibratory electro magnetic separator.

Materials of Construction

Used as a plaster base for all types of work requiring a high class finish and excellent construction, the clay lath marketed by W. H. Colt (London) can be bent, twisted, and formed to any shape and rigidly fixed. The company's stand (B.506) is largely constructed with Colterro stretched over a steel framework and left part unplastered so that the construction will be visible. During the Fair, the company will run a continuous film to show how Colterro is fixed.

Other items on show will be Canadian cedarwood roofing shingles, in their weathered colour of silver-grey, and chimney cowls.

Metal Products

A large range of metal exhibits will be seen on stand B.517/416 of Fredk. Braby and Company. Among these will be steel drums for the oil, paint, and chemical industries, perforated metals, culverts, ice moulds, metal partitions (the stand itself is constructed of "Bar-Form" metal partitions designed by the company), cisterns, cylinders, and hot water tanks. There are also aluminium trays for all branches of the food industry, and a galvanised pressure vessel, 8 ft. 7 in. high × 3 ft. 6in. diameter.

■

Displayed on their stand No. B.329 will be a wide range of products manufactured by G. A. Harvey and Co. (London).

The Lummus Multilok heat exchanger, fabricated under licence by the company, has long been recognised as an aid to efficient production and will be of interest to all who are concerned with increased output and reduced costs. The exhibit will serve to indicate the type of work and class of finish produced in their factory.

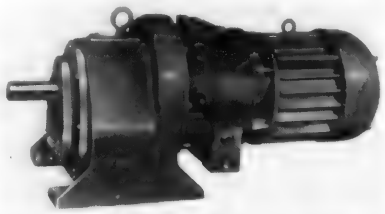
During the past few years this company have added considerably to their facilities for the fabrication of steel plate, and they are able now, with one of the most modern plants in the world, to manufacture pressure vessels, autoclaves, fractionating and absorption towers in steel plate up to 3 in. in thickness and of any diameter and length, to Lloyds Class 1 Rules, Insurance Companies and A.P.I.—A.S.M.E. Codes.

■

Stainless steel in all forms and finishes, with particular emphasis on polished material, will be found on stands D.325 and 422 occupied by Padley and Venables. Exhibits will include sheets, strips, bars, tubes, sections, and finished articles made from stainless steel.

Motors and Electrical Equipment

A full range of infinitely variable speed gears from ¼ to 6 b.h.p. with working models which explain the action will be shown by Allspeeds on stand D.257. One of the most useful adaptations on show will be the variator flange mounted to motor on input side and flange mounted on the output side to a reduction gear, thus providing a co-axial, in-line unit suitable for the lowest ranges of speed.



Kopp variator for 1 to 5 b.h.p. power output to give low output speeds.

Both mechanical and electrical remote control units will be exhibited, while the extreme accuracy and sensitivity of speed change will be demonstrated by Stroboscope. All units have a range of 9 : 1

■

A selection of BTH products of the latest design for use in all kinds of industry at home and overseas will be exhibited on stands C.511 and 410.

The exhibits range from an 11 kV, 250-MVA switchgear unit for power station and industrial service to industrial electric heaters and fractional horsepower motors, and the recently introduced 16 mm. sound film projector.

Many of the exhibits will be shown as working demonstrations including switchgear, a new design of alternator with close voltage regulation; Stacreep crane control; a high speed batch counter (electronic) applied to the measuring and cutting of lengths of paper tape; and sectional motors running under their own power.

The Westool D.C. solenoid.

The latest addition to the range of D.C. and A.C. solenoids manufactured by Westool will be displayed on stand D.351, together with the representative examples of other available types.

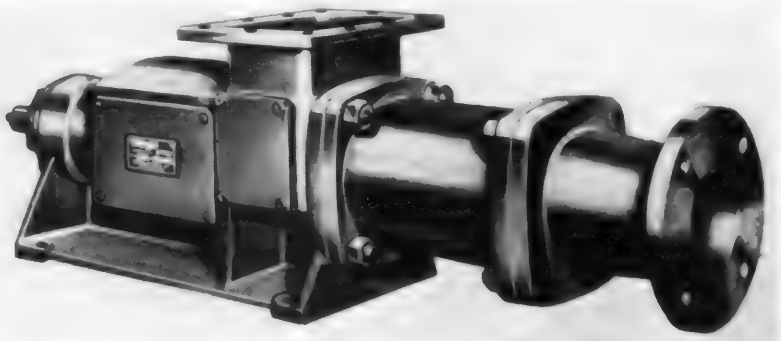
Plastics

Mouldrite thermosetting and thermoplastic moulding powders will be exhibited by I.C.I. Plastics Division on stand D.619. By means of end-products, it will be shown how these powders are utilised by the engineering, electrical, and motor industries. Synthetic resins for use in foundries will be specially featured and Fluon (polytetrafluoroethylene) will also be shown.

The Metal Division will display their products on stands D.308 and 409. Other exhibits of the company are new synthetic fibres and zip fasteners at Earls Court on stands R.421, 518, 525, and 638, and at Olympia on stand D.32 will be a mural depicting the evolution of chemistry during the four centuries separating the reigns of the two Elizabeths.

Pumps and Valves

The main exhibit on stand D.716 of Mono Pumps is a unit for handling powdered or granulated dry material. The principle of the Mono pump has been applied to this duty by modifications in its internal construction to assist the flow of powder through the pump. The operation of this unit will be demonstrated during the Fair by drawing the powder from a hopper and lifting the material back to the hopper. This



Mono pump for the handling of dry materials.

demonstration, showing its use on simple transfer duties, is achieved without the aid of compressed air. The intake and output is uniform and therefore steady quantities of powder progress through the pipeline at the same rate of flow, but where the conveyance of powder involves delivery distances greater than those encountered on simple transfer duties, compressed air must be used to fluidise the material and to prevent a build-up of high pressure while the powder is progressing towards the discharge point.

Another pump to be exhibited is the small wet vacuum type which can be applied to vacuum filling machines. The display will also include stainless steel pumps for use in the pumping of fruit juices, hot soups, jam, fresh peas, sugar fondants, biscuit fillings, and fruit pulps.

*

A wide range of valves will be shown by the Saunders Valve Co. on stand D.125. These will include examples of the new ebonite valve. The company's range of Safran centrifugal pumps, in eight sizes, is now extended by the introduction of a series of multi-stage and vertical trunk pump models.

Self-contained electric, petrol, and Diesel drive units will be on view during the Fair.

Sectional Buildings

One of their new range of buildings will be shown by the All Purpose Building Co. on outside stand 1304 (also at Earls Court, stand Y.5). These buildings are manufactured in three standard designs of 40 ft., 50 ft., and 60 ft. span models. The buildings are all of lattice portal frame design, manufactured on a unit construction basis, so that although the standard building is 100 ft. long, buildings of either greater or lesser length can easily be supplied, made up of the standard 12 ft. 6 in. multiples.

The steel frame can be clad with either asbestos or aluminium corrugated sheeting. Windows can be placed in any of the standard sidewall bays and door assemblies can be placed either in the endwalls or in the sidewalls to suit specific requirements.

An Apoe portal frame building showing steel lattice portal frame, partly sheeted with asbestos.

Ventilation

A complete range of industrial ventilators will be found on the Colt Ventilation stand (B.506). The exhibit shows how the ventilators operate, the ease with which they are fitted, how a survey is carried out, and details of some of the schemes already installed in over 3,000 factories.

It will be possible to arrange for surveys of premises during the course of the Fair. This will be in time for a ventilation scheme to be put in hand and completed by the summer.

OLYMPIA

Cans and Canning Equipment

A large selection of all types of Metal Box containers and other products will be found on stands F.19 and 20. The company's services will be illustrated by a number of special exhibits, including a section of can runway equipment. Also on view will be the company's high speed rotary double seamer for closing filled cans, the Garda cap closing machine with a speed of 65 jars a minute, and the semi-automatic Garda capper.

The company are also exhibiting at Birmingham (stands A.327 and 422).

Colour Measurement

Among the range of colour measuring equipment to be shown by The Tintometer Ltd. on stand B.10 will be the Lovibond Schofield tintometer for measuring and recording colours, the Lovibond tintometer together with the spinning device for measuring unevenly coloured samples, the Lovibond comparator which is used for a large range of chemical tests, *p*H determination, etc., and the artificial white light equipment for use with the Lovibond comparators. Also exhibited will be a selection from the company's range of fused glass cells and a selection of publications dealing with the theory and practice of colour measurement.

Flavours and Essences

On stand D.23 W. J. Bush and Co. will be exhibiting Fine Chemicals, aromatics, etc., and, for the first time, Tru-Sil powder flavours, a new range of true-to-name sealed flavours in powder form. They will also be displaying Vanillin Pure 100 per cent. made from clove oil.

Insecticides

An effective remedy for the protection of bulk foods in storage against the ravages of insect pests is Fumite DDT/Lindane and pure Lindane smoke insecticides. This product is supplied in the form of pellets and generators of different sizes which, when ignited, liberate a dense white insecticidal smoke which penetrates every corner and crevice, driving pests out into the open to die where they are easily swept

An installation of the Colt roof extractor ventilators.

The Lovibond comparator can be used for a wide range of tests.

away. Non-tainting and harmless to the operator at recommended dosage, this method is claimed to be very economical, requiring neither labour nor equipment and costing only a few pence per thousand cu. ft.

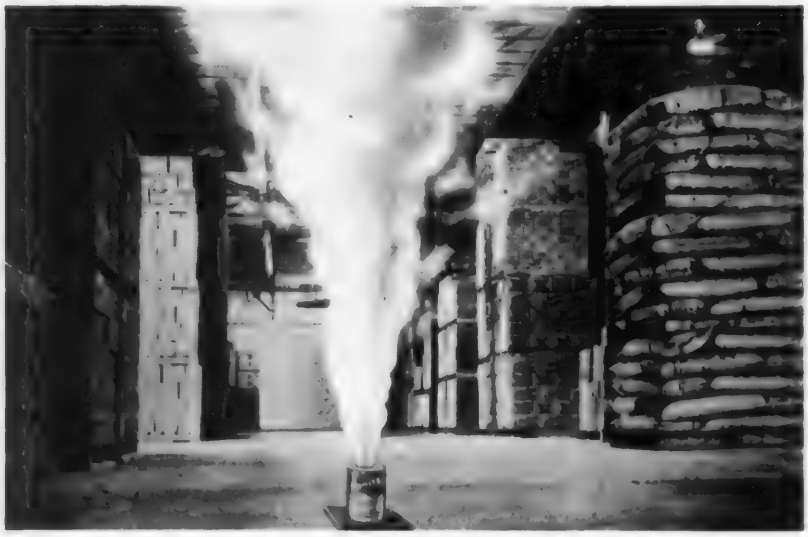
Manufactured by Waeco, Fumite is being exhibited by Buggé's Insecticides on stand D.8.

Packaging and Stationery

Personal and table stationery will be one of the features of the John Dickinson stands (O.26 and 33). Another section of the stand will be devoted to a display of a complete range of books for all commercial uses. The company will also be exhibiting a large selection of seals, labels, and envelopes, Karrier bags, featuring the new "En Suite" development in point-of-sale advertising, acetate containers, and cards for every purpose.

The Butterfly Brand Tackytaper.

The whole range of Butterfly Brand stationery products, including gumstrip sealing tapes and coils, decorative transfers, and envelopes will be shown by Samuel Jones and Co. on stand O.43, together with the full series of white, coloured, and coated non-curling gummed papers, heatseal and special coated papers, adhesives, and tacky labels.



The Fumite smoke insecticide in a warehouse.

In the packaging section of this stand will be seen the gumstrip sealing machines and tapes, plain and printed. The company's representatives will be present to discuss all angles of the process of wrapping all kinds of goods and packages.

Petroleum Chemicals

Symbolising the rapidly developing strength of the petroleum-chemistry industry, a 25 ft. high replica of a Hortonsphere, used for the storage of petroleum gases under high pressure, will dominate the Shell stand (D.11).

In addition a broad range of product applications will be portrayed by means of panels entitled "Industry," "Agriculture," "Home," and "Public Health."

As a background to these displays a 14 ft. high photographic montage will show prominent features of the Shell chemical plant at Stanlow.

Sealing Compounds

Sealex flowed-in can sealing and cap compounds will be shown by Rubber Latex on stand D.40. This company have recently increased their range by the inclusion of drum lining compounds. The company also manufacture various types of latex adhesives used by the food trade among which are special rust resistant labelling adhesives to enhance the sales appeal of tin boxed goods, such as biscuits, which are destined for export to the tropics.

Tablet Machines and Coating Pans

Tableting machinery, pelleting presses, tablet compressing machinery, coating pans, stainless steel mixers, granulators, and automatic water stills are to be exhibited by Manesty Machines on stands F.11 and 12.

Water Treating Equipment

In addition to their use for water softening and water demineralising, the Permutit resinous ion exchange materials to be shown by the company on stand O.16 have extensive uses in various industrial processes as, for example, in the recovery of valuable metals from waste effluents, in the purification of such liquids as lactic acid, glucose, wines, and fruit juices, in the separation of rare earth elements, and in the concentration of antibiotics. Also on show will be a portable Deminrolit plant for producing small quantities of demineralised water of purity equivalent to that of commercial distilled water and mixed bed ion exchange unit which produces "conductivity water" of extremely high quality and purity equal to that of water which has been subjected to multiple distillation.

World Food News

Fishing Boat Congress

World fishing is an important part of world feeding, and if all countries —and particularly the less-developed ones—are to make the most of the harvest of the seas, both of the fish themselves and their by-products, there must be a measure of co-ordination in the types of fishing vessels and methods of propulsion and the equipment they employ to take their catch.

An International Congress has therefore been sponsored by FAO, and is to be held in Paris from October 12 to 16, 1953, and in Miami, U.S.A., from November 16 to 20, 1953. At this meeting technical papers will be presented by the designers of fishing vessels and their equipment from all over the world.

Irish Carcass Meat Plants

That there was no foundation for the statement that several meat plants in Ireland were in danger of collapse, was emphasised by Mr. Lemass, the Minister for Industry and Commerce in the Irish Parliament.

Neither was there any justification for the statement that a levy of £3 a hide had been imposed for the benefit of the leather trade. So far as hides arising from current carcass beef exports were concerned, the export of such hides was permitted and world prices were obtainable. Applications by carcass mutton exporters for permission to export sheep pelts were dealt with on their merits and in the light of the overall supply position.

U.S. Food Supplies

The Department of Agriculture forecasts that imports of food supplies into the United States in 1953 will probably equal those imported last year. Domestic food consumption in 1953 is likely to continue at about the same level as in recent years.

Civilian consumption of meat per person is expected to be slightly lower. Imports of fresh, frozen, and canned meats are expected to approximate the 1952 total, but amount to no more than 2 per cent. of total supply. Imports from Canada are scheduled to be resumed if no new outbreaks of foot-and-mouth disease are reported. Receipts from other countries may not be as large as last year, chiefly because prices in the United States may not be as attractive to exporters as they were in 1952.

There is a likelihood of a somewhat weaker civilian demand for fishery products in 1953 than in 1952. The international trade of the United States in these products in 1953 is expected to follow the same pattern as last year. Imports of these commodities are expected to be larger than last year, although the increase may not be as large as that which occurred between 1951 and 1952. Some further decline in exports of fishery products is anticipated as a result of the still smaller exportable supplies of those canned fishery products which are popular in foreign markets.

Consumption of dairy products is expected to be close to the 1952 rates. In the period January 1 to February 20, 1953, the Government bought 65 million lb. of butter, 21 million lb. of cheddar cheese, and 60 million lb. of non-fat dry milk solids to support milk and butterfat prices as required under law. Commercial exports of dairy products probably will be no larger this year than last, while the volume of imports in 1953 is very uncertain.

Fats and oils consumption will continue at about the same rate as last year. Exports of edible fats and oils (including the oil equivalent of oil seeds) probably will be no larger than last year. The apparent shift from the consumption of butter to oleomargarine is likely to continue, and oleomargarine consumption per person this year may be about equal to that of butter for the first time.

Stocks of wheat, corn, and rice are sufficient to meet anticipated domestic and export needs until new crops are harvested. Consumption of grain products will be about equal to that of last year, and prices will average substantially the same as in 1952. The export demand for wheat is expected to be lower, while that for rice probably will continue strong.

Exports of Australian Foodstuffs

Australia's exports of meat and dairy produce during the current financial year (ending June, 1953) will show an increase in value of A£40 million over the previous financial year. Frozen meat exports would include 38,000 tons of lamb (against 11,500 in the previous financial year), 24,000 tons of mutton (3,100), and 80,000 tons of beef (39,000).

There would also be higher exports of eggs, sugar, dried fruits, and barley. Canned meat exports to the U.K. would be 25,000 tons higher than in the previous period.

The wheat crop was now estimated at about 190 million bushels following record yields per acre.

Vitaminised Bread

Bakers in Oslo say there has been a great increase in the demand for vitaminised bread during the last year, although no propaganda of any kind has been conducted in its favour and although it costs almost a penny a loaf more than ordinary bread. The vitaminised bread has vitamins A and D added and it also contains a coarse flour which provides B vitamins. Because of its higher fat content, it keeps better than ordinary bread.

Pickles in Packets

As a result of six years' research, a new plastic bag container has been devised by H. J. Heinz Co. in the U.S.A. for the packaging of dill pickles in brine.

The bag is made of two types of plastic film which have been laminated together. One film is acid resistant, while the other provides a barrier for retention of essential oils and other properties. The two layers combine to prevent leakage of the product in shipment or in the store.

In packaging the product, a vacuum is drawn or applied to the bag at the time of sealing to promote better quality retention and improved shipping qualities, as well as longer life.

Food Technology in Australia

As a result of the work of the Council of Australian Food Technology Associations, formed in August, 1948, to unify the various Food and Drug Regulations of the different State Governments, a uniform approach in all matters concerning these regulations is now assured and the Council is hopeful that, with the support of kindred associations as well as Federal and Government Departments, it will not be long before a conference of the competent bodies will be convened.

C.A.F.T.A. and its State Associations work in close collaboration with all kindred Associations, particularly the Australian Sections of the Institute of Food Technologists of America.

A further activity of the State Associations is to hold public taste panels on selected foodstuffs. The verdict of this public acceptance test is communicated only to the manufacturer concerned by the Officer in Charge of the taste panel and since all samples are appearing under code numbers, known only to the one office, absolute secrecy is otherwise observed.

Flooring for Bakeries

Questions about the type of tile material to be used and the method for sealing the joints in a floor to be laid in a cake bakery are answered in Information Service Bulletin No. 25 of the American Society of Bakery Engineers.

This one-page bulletin gives the opinions of two well-qualified bakery engineers on these points and includes a sketch of the manner in which the tiles should be laid.

Bergen's Fish Freezing Plant

A £1,400,000 freezing and refrigerator fish store is nearing completion at Bergen, Norway. The store can take up to 12,000 tons of fish, and is understood to be the biggest fish freeze store in Europe. An ice-making plant will be able to supply up to 325 tons of crushed ice an hour. Temperatures in the various sections of the freeze store are down to 45°C. below zero. In the refrigerator sections, 560 tons of cork panelling have been used for insulation. The new store will greatly augment Bergen's export capacity for frozen fish. For shipping the fish abroad, the store has its own quay more than 1,000 feet long.

Saudi Arabia Exports Packaged Dates

Saudi Arabia is exporting packaged dates for the first time in the country's 3,000 year history, following technical advice from a Food and Agriculture Organisation expert.

Dates had been exported in bulk from Saudi Arabia for many years. The idea of packaging them in an attractive and portable container occurred to Mr. Theodore Carlson of California as a means of providing an appropriate souvenir for sale to the 150,000 Moslem faithful who make a yearly pilgrimage to the holy cities of Islam—scene of the life and death of Mahomet.

The proposal opens a new export industry that is expected to increase the wealth of this oil-rich but agriculturally backward country.

The FAO expert, who had been familiar with packaging dates in his country, was asked by the Saudi-Arabian government to advise and assist in the selection and installation of processing equipment and to design a package. Machinery for the Cellophane and cardboard wrapping was brought in from the United States.

Saudi Arabia has just started assembly line packaging expected to reach 50 tons of dates during this year, and the first two packages to leave the country were flown to FAO Headquarters at Rome as a mark of appreciation. The flavour of these dates was excellent.

Klip Fish Exports

In 1952 Norway exported 58,000 tons of klip fish to a value of £10,000,000. Brazil was the biggest customer, and took 40,000 tons. Klip fish is cod which is salted and then dried in the sun and wind for a period of several weeks. Spain, Italy, Portugal, and the South American countries have been large and steady buyers of Norwegian klip fish for many years.

New Cheese Types in New Zealand

The possibility of manufacturing yoghourt, cottage cheese, and homogenised cream from New Zealand surplus milk and skim milk is being investigated by the Palmerston North Milk Treatment Station. The work is being done at the request of the Marketing Department with the co-operation of the New Zealand Dairy Research Institute and Massey College.

If any of the experiments prove successful and a satisfactory method of marketing can be found, the products will be made available to the public. It is understood that cottage cheese manufacture may become a subsidiary activity of all State-owned treatment stations.

Experiments are also due to begin shortly at the Institute on the manufacture of "Swiss" cheese. However, these experiments are likely to extend over a long period before it can be decided whether the product is suitable to be marketed.

Handling Soft Dough

An air-operated piston pump that moves dough directly from mobile steel troughs to the depositor hopper of the baking oven is facilitating biscuit processing at the Megowen Biscuit Co., Chicago, and contributing to better quality. The pump is the direct result of several years' search for a procedure to replace slovenly dough lifting at the plant. In addition to providing an improved materials handling technique, the pump and its operating principle is reported to make possible more effective dough mixing and the use of improved trough equipment — factors that have increased the pump's operating capacity 50 per cent. and cut surface trough cleaning requirements by half.

In design, the pump, which was specially developed by the Alemite Division of the Stewart-Warner Co., Chicago, involves a compact stainless steel unit with a smooth-walled suction tube. The latter includes a pumping piston that is operated reciprocally by an air-powered motor located on top of the pump. Suspended from a supporting hoist, the pump hangs down into a deep steel 5 ft. long trough filled with biscuit dough. Operating on a suction principle, with air pressure at 80 lb. per sq. in., the pump draws dough material from the trough into the tube at the bottom, and discharges it, by upward movement of the pumping piston, through a surge eliminator at the pump outlet.

The operator is stationed at the feeding point (from which the troughs are discharged), supervising the dough-feeding process and keeping the hopper at the proper level by adjusting the pump speed through an air-pressure regulator. As the trough nears the empty stage, the operator shovels the dough to the feed end of the trough within range of the feed end of the pump. The unit is then removed from the suspension hoist and transported to a cleaning area, where the motor portion is quickly separated from the pump unit. On removal of the motor, the pump is flushed out, scrubbed thoroughly with hot water, and sterilised with live steam.

Sugar Workers Congress

The first world congress of sugar workers opened in Havana on March 11 to discuss improvements in wages, living standards, and working conditions in the industry. Delegates attended from 16 sugar producing countries—United States of America, India, Mexico, Jamaica, Barbados, British Guiana, Costa Rica, Mauritius, Puerto Rico, Colombia, Ecuador, Panama, Peru, Malaya, Uruguay, and Cuba.

Señor Jose Luis Martinez, of Cuba, was elected President of the Congress, and Señor Hermenegildo Aldana (Mexico), Mr. David Stewback (International Confederation of Free Trade Unions), and Señor Nicolas Nogueras (Puerto Rico) were appointed Vice-Presidents.

Irish Cream for Britain

A market for half a million gallons of Irish cream at a price of not less than 50s. per gallon has opened in Great Britain following the decision of the British Government to import cream from the sterling area during April to July inclusive.

Mr. D. J. Barry, general secretary of the Irish Creamery Managers' Association, made a preliminary investigation of the cross-Channel cream market in March. Co-operative creameries proposing to avail themselves of a market that would need that quantity of cream from Ireland need not sell at less than 50s. per gallon, or double the price ruling on the Irish market.

Seven million gallons of whole milk will be needed to produce so much cream. At 50s. per gallon for the cream, it would be possible to pay the producer 3s. 6d. per gallon for whole milk.

OVERSEAS ENQUIRIES

Canned Sardines and Other Fish

Levy Brothers Ltd., P.O. Box 99, 44, Port Royal Street, Kingston, British West Indies, have expressed interest in representing a United Kingdom canner or exporter of canned sardines and other varieties of canned fish.

Firms interested in this enquiry should forward quotations direct to the company.

■

Chocolates and Sugar Confectionery

Sociedade Ultramarine de Representacoes Lda., Caixa Postal No. 2416, Luanda, Angola, Portuguese West Africa, wish to obtain the representation of a British manufacturer of chocolates and sugar confectionery. The company, which is of recent establishment, already represents several United Kingdom manufacturers of other commodities and covers Northern Angola at present; an office in Lobito is to be opened later.

Firms interested in this enquiry should forward quotations direct to the Luanda firm.

■

Canned Fish and Vegetables

Warehouses Ltd., P.O. Box 6387, Nairobi, have expressed interest in representing United Kingdom canners, in particular, canners of fish and of vegetables on a commission basis.

The main interest of the East African firm is in operating storage capacity in Nairobi. This brings the firm's principal, Dr. Zitron, into touch with importers, which assists him in obtaining indents for the lines in which the firm acts as commission agents. Dr. Zitron also tours the territories, visiting Mombasa, Dar-es-Salaam, and Kampala every three months.

Interested firms are asked to communicate direct with the company.

■

Confectionery for U.S.A.

Ever-so-Fresh Company, 3926, W. Roosevelt Road, Chicago 24, Illinois, have expressed interest in corresponding with United Kingdom confectionery manufacturers of "penny candies" and other lines of interest primarily to children.

The company are wholesalers of nuts and confectionery specialising in packaging these lines in cellulose wrapping and are considered to be a suitable connexion for United Kingdom firms.

The so-called "penny lines" are items which used to sell for 1 cent but now often cost 2 cents. They include such items as small wrapped bars of chocolate, large wrapped toffees or similar confections, licorice in fancy shapes, or any other items which are popular with the juvenile trade. The essential element is that each unit should be priced to retail for one or two cents.

British firms interested in this enquiry, irrespective of whether they are already represented in this market, are invited to send samples and quotations to Mr. H. Feldman at the above address. Prices should be in U.S. dollars preferably c.i.f. Chicago.

The foodstuffs mentioned are subject to the United States Food and Drug Administration Regulations.

■

Canned Foods

Mr. J. K. Hunter, head of the Purchasing Department of the United States Trading Company, Akron, Ohio, wishes to purchase (*inter alia*) the following goods from the United Kingdom, for shipment direct from the United Kingdom to Monrovia, Liberia, West Coast of Africa: Canned candy (each piece wrapped and of a type which does not readily melt in the tropics); canned meat (cans of 16 oz. max.); and canned fish.

Mr. Hunter would like to contact United Kingdom firms trading with the West Coast of Africa with a view to doing business with them in moderately priced goods, of a quality suitable for the native population. The firm are also interested in buying job lots and are prepared to buy in large quantities.

Interested United Kingdom firms should communicate direct by air mail with Mr. J. K. Hunter at the address given, quoting prices, in duplicate, c.i.f. Monrovia, and giving full particulars, including delivery dates.

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The Prevention of Corrosion

Mr. J. C. Millar, of Corrosion Consultants Ltd., 1292, W. Georgia Street, Vancouver 8, B.C., has expressed interest in contacting United Kingdom firms specialising in devices, materials, and equipment for the prevention of corrosion in tanks, boilers, and water pipes.

Mr. Millar believes that many Canadian firms are prepared to put up substantial sums of money to prevent the serious losses incurred by corrosion. He is of the opinion that British firms have considerably more knowledge about the problems of corrosion than is available in Canada and he is anxious to establish connexions with United Kingdom firms in this field.

Firms interested in this enquiry should communicate direct with Mr. Millar at the above address.

Cans by the Million in Northern Ireland

CO-OPERATION BETWEEN GOVERNMENT AND INDUSTRY

Directors and executives of many manufacturing concerns recently established in Ulster have expressed warm appreciation of the co-operation they have received from the Ministry of Commerce under the Government's industrial expansion programme and their satisfaction with the high quality of the labour employed. One of these firms is the Metal Box Co., whose factory at Portadown has been visited by Lord Glentoran, Parliamentary Secretary to the Ministry of Commerce, in the course of a comprehensive tour of new industries.

Built in 1946 with the immediate object of serving the canners of Northern Ireland and the Irish Republic, the Portadown factory has a floor area of about 62,000 sq. ft. and stands on a site of 11 acres that allows ample space for extension. About 280 workers are employed and more than 180 million cans a year are produced. Into the cans manufactured in 1952 went over 40,000 tons of fruit and vegetables, as well as quantities of milk, meat, and soup.

"When we began operations here," said the company's spokesman, "we undertook the training of our own workers. The quality of the skilled and semi-skilled labour is very good indeed. We work a five-day week, with two eight-hour shifts a day. The number of workers employed and the annual output are a good indication of the importance of this industry to the post-war economy of Northern Ireland."

Portadown is one of six factories which make up the Open Top Group of Metal Box. In 1930, the company produced 23 million cans; in 1939, production had risen to 636 millions. Last year the figure was over 1,300 millions, or nearly 100 cans a year for every household in Britain.

In addition to the manufacture of cans for processed food, Metal Box make a wide range of metal containers in which are packed a great variety of products, such as paint, pharmaceuticals, tobacco, oil, and confectionery. The company's activities are not confined to metal containers; cartons and composite containers, domestic hardware and fancy goods, caps, toys, advertising materials, and machinery are made in one or more of the company's 30 factories in the United Kingdom.

Overseas the company is established in India and Pakistan, South and East Africa, Malaya, and the British West Indies, and associate companies are operating in Israel, Europe, and Australasia.

News from the Ministries

Milk for Manufacture

The prohibition on the use of liquid cow's milk in bread, biscuits, flour confectionery, chocolate and sugar confectionery, ice cream, and synthetic cream has been removed. In addition, manufacturers will be free to be supplied with or to obtain milk without specific authorisation.

Milk production normally falls sharply in the late summer, when it will be necessary to bring back the control on milk used in manufacture.

Sugar and Dried Fruit Products

Certain changes have been made in the Board of Trade import licensing regulations which restrict imports of sugar products in order to safeguard supplies of raw sugar under the Commonwealth Sugar Agreement.

In future licences will be required for the import from any source of tamarinds in syrup and of halva.

Similarly, licences will be required for the import from any source of fruit pulp containing dried fruits of the vine, *i.e.* currants, muscatels, raisins, or sultanas, or of any fruit paste.

There is no intention to restrict the quantity of imports by *bona fide* importers of any of these foods from the sources previously permitted, but applicants will be required to give a detailed formula of the ingredients before an import licence is granted.

Allocations for Food Manufacturers

Additional quantities of glucose, milk powder, and oils and fats are to be made available to food manufacturers as follows:

Glucose.—The increased allocations of glucose announced in December, 1952, for the period January 25 to May 16, 1953, are to be continued for a further period to July 11. An additional 4,500 tons of glucose is to be allocated in this period to chocolate and sugar confectionery industry, the largest manufacturing user. Other food manufacturing industries concerned are biscuits, flour confectionery, bakers' sundries, preserves, table jellies, medicinal beverages, pickles and sauces, candied peel and glacé cherries, and soluble coffee powder.

Milk powder.—Allocations of full cream milk powder to those food manufacturing industries whose supplies had to be restricted in 1952 have, as announced in January, 1953, been increased for the first half of 1953 to the level of their purchases in 1951. For the three months from April 1 to July 30, the current rates of allocation of skim milk powder to those industries will be increased by 12½ per cent. of 1951 purchases. It is hoped to maintain the increased rates for both full cream and skim powder until the end of the year. The food manufacturing industries concerned include chocolate and sugar confectionery, flour confectionery, invalid foods, soup, and ice cream.

Oils and fats.—A further quantity of fat that has not been taken up from allocations to trade users is to be re-allocated in the current period to those industries with special claims who can use the types available. The total quantity of fat for re-allocation is about 3,900 tons, mainly in the form of palm kernel oil and dripping. The main industries which will benefit are chocolate and sugar confectionery, biscuits, and flour confectionery. Further surpluses will be redistributed in subsequent periods.

These additional supplies, together with the lifting of restrictions on the use of liquid milk, the recently announced increases in allocation of dried fruit, and the increased quotas for private imports of commodities such as edible nuts, should materially help manufacturers to expand their production. Further increases in allocations of dried fruit and peanuts may be possible later this year.

The Labelling of Food Order, 1953

The Labelling of Food Order, 1953, which came into force on April 5, 1953, re-enacts in a consolidated and revised form the Labelling of Food Order, 1950, as amended.

The principal changes are:

(*a*) Definitions of biscuits and flour confectionery are provided for the purpose of the First Schedule in which are listed those products which are exempt or partly exempt from certain of the provisions of the Order relating to the labelling of prepacked food for retail sale (Article 2(1)).

(*b*) Retailers who prepack food consisting of two or more ingredients on the premises where it is sold are required on and after July 1, 1953, to declare the ingredients on the labels (Article 4(3)); retailers will then be subject to the same statutory requirements in this respect as other prepackers.

(*c*) The statutory declaration of alcohol content for British wines may be printed on the labels either in dark type on a light ground or in light type on a dark ground at the labeller's option, as is allowed for brandy, gin, rum, and whisky (Article 4(4)).

(*d*) Where the description "French coffee" is used on a label it must be followed immediately by the words "coffee and chicory mixture" in print substantially as conspicuous as the words "French coffee," and where the description "Viennese coffee" is used it must be followed immediately by the words "coffee with fig seasoning" or "coffee with fig flavouring" in print substantially as conspicuous as the words "Viennese coffee" (Article 7(3)). These requirements come into force on August 1, 1953, for sales by packers or labellers other than by retail, on November 1, 1953, for sales by any other person than by retail, and on February 1, 1954, for sales by retail.

(*e*) Emulsifying salts (as defined) and edible starch may be designated as such when forming an ingredient of some other food, without the origin of these substances also having to be declared (Item 3 of Table A in the First Schedule).

(*f*) Preparations specified in the 1948 British Pharmacopoeia and the 1949 British Pharmaceutical Codex are exempt, from December 1, 1953, from the requirement that ingredients must be disclosed on the labels (Item 8 of Table A in the First Schedule).

Beef and pork sausages and sausage meat and home canned fruit and vegetables continue to be exempt from the requirement that ingredients must be specified on the labels.

Import of Bananas

The Government of Jamaica has now approved the agreements which were initialled last December by the Jamaica Government Banana Delegation and by representatives of Elders and Fyffes and the Jamaica Banana Producers' Association. Under these agreements the two marketing companies will provide ocean transport and act as selling agents for Jamaica bananas in the United Kingdom on the termination of the bulk purchase contract between the Government of Jamaica and H.M. Government.

The Government of Jamaica has also agreed to release H.M. Government from its contract on March 28, 1953.

The import of bananas from non-sterling, non-dollar sources is also to be returned to the trade. The Board of Trade will shortly announce details of the licensing arrangements. No commitments should be made by private traders in the meantime.

Poisonous Substances

Regulations under the Agriculture (Poisonous Substances) Act, 1952, came into force on March 31, 1953. They prohibit the use in agriculture and horticulture of weedkillers and insecticides containing dinitro and organo-phosphorus compounds unless certain precautions, including the wearing of protective clothing, are observed.

Manual of Nutrition

Following publication of the earlier editions in 1945 and 1947, H.M. Stationery Office have now published the third edition of the *Manual of Nutrition* (price 2s.). It takes the same general form as the previous ones, but its chapters have been slightly re-arranged, and its text and tables entirely revised. In particular, all the tables of food composition have been brought up to date, and the sections on energy expenditure and nutrient requirements have been revised to take account of the post-war advances in nutritional knowledge and the end of war-time shortages.

An important new feature is a list of textbooks and specialist journals for those who wish to pursue their study of nutrients more deeply.

Relaxations on Imports

A number of important relaxations in the restrictions on imports from Western Europe and certain other foreign countries have been made. Included among the goods restored to Open General Licence are unrationed cheese, lentils and butter beans, olive oil, tomato purée and juice, glacé cherries, peaches, apricots, pineapples, tangerines, clementines, mandarines, and food preparing and processing machinery.

Among the items for which increased import quotas are announced are edible nuts, essential oils, grapes, canned fish, canned tomatoes, glassware, and drugs.

Uruguayan Meat Contract

A contract for 30,000 tons of carcass meat and 2,000 tons of canned corned meat from Uruguay was signed in Montevideo on March 27 by United Kingdom and Uruguayan representatives.

Under the contract, the Uruguayan Government undertakes to sell to the United Kingdom during the calendar year of 1953, not less than the above quantities at prices similar to those recently agreed between the United Kingdom and Argentina.

The 30,000 tons of carcass meat is to be supplied as:

	tons
Beef	22,000
Lamb	2,000
Offal	3,000
Manufacturing beef ..	3,000

The contract provides for the resumption of shipments of chilled beef on the same terms and conditions as those agreed with Argentina, *i.e.* at a premium of £20 a ton on the price of £161 a ton for chiller quality beef.

This contract represents an increase on the previous contract of 10,000 tons of carcass meat.

Nutrients per 100 g.	*Extraction Rate*		
	80 per cent. National (including added calcium carbonate)	*70-72 per cent. (unrestored)*	*70-72 per cent. (restored) (including added calcium carbonate)*
Energy value (calories) ..	341·00	343·00	343·00
Carbohydrate (g.)	70·20	72·00	72·00
Protein (g.)	11·70	11·30	11·30
Fat (g.)	1·40	1·10	1·10
Calcium (mg.)	143·00	16·00	142·00
Iron (mg.)	1·65	1·25	1·65
Vitamin B_1 (mg.) ..	0·24	0·08	0·24
Nicotinic acid (mg.) ..	1·60	0·80	1·60
Riboflavin (mg.)	0·06	0·05	0·05

Chemical Composition of Flour

In reply to a question in the House of Commons on March 2, Dr. Hill, Parliamentary Secretary, Ministry of Food, gave information concerning the chemical composition of representative flours as shown in the Table above.

Marketing of Eggs

The Eggs Order, 1953, brings into operation the interim arrangements for dealing with hen eggs, which were removed from allocation and price control as from March 26, 1953.

Every producer, regardless of the size of his flock, will have the following outlets for his eggs: he may sell them direct to a consumer buying them for use in a private household or he may sell them to a licensed packing station, either direct or through a licensed buyer or licensed collector, for quality testing, grading, and packing. Producers may not sell eggs for use in a catering establishment, or in an institution, or for manufacture. These restrictions will not apply to the areas—principally the Highlands and North West islands of Scotland—hitherto known as the "uncontrolled areas," and any producer elsewhere in Great Britain with no more than 25 fowls who has at present an arrangement for supplying his eggs direct to an institution, will be licensed by the Ministry of Food, on application, to continue to do so.

Minimum prices on sale by producers to licensed packing stations, licensed buyers, or licensed collectors, are fixed by the Order.

Prices to consumers will not be controlled and consumers will no longer be required to register with a retailer for eggs.

All graded home-produced eggs of first quality will be marked with a stamp incorporating the letters "M.F.," the registered number of the packing station at which the eggs were graded and packed, and a letter, A, B, C, or S, indicating the size of the egg. Second quality eggs will be marked "second." Imported eggs will continue to be marked with the name of the country of origin or with the word "foreign."

Decontrol of Cereal Fillers

Cereal fillers were freed from price and other controls on April 1, 1953, when the Cereal Fillers Order, 1951, as amended, was revoked.

Maximum Starch Prices

The Ministry of Food is continuing to sell maize starch at a fixed price to dealers, who are free to sell to users without price control, in competition with each other. Farina and imported farina dextrine are also continuing to be sold at fixed prices by the Ministry to first hand distributors, who will sell to dealers and/or users free from price control. The system of distribution will continue to be by allocation, and is subject to the existing permits and/or licences. As in the past, users may nominate a new supplier at any time should they desire to make a change.

The maximum prices payable by users for dextrines still subject to price control are set out below and are operative as from March 29, 1953, and thenceforth until further notice.

Description of Starch	*Maximum Selling Price delivered to Users per ton net weights* £ s. d.	*Remarks*
British-made Maize Dextrine		Lots of over 10 cwt. but less than 1 ton: 10s. per ton extra.
(*a*) White	72 7 0	Lots of over 5 cwt. up to 10 cwt.: 20s. per ton extra.
(*b*) Yellow	77 17 6	Lots of 5 cwt. or less: 40s. per ton extra. Deliveries to Northern Ireland: 40s. per ton extra.
Maize British Gum	81 12 6	
British-made Farina Dextrine		Selling prices not controlled.

Information and Advice

This Service is available to subscribers to FOOD MANUFACTURE. If a stamped addressed envelope is enclosed replies will be sent by post, but enquiries cannot be answered by telephone.

Milk Chocolate Crumb

B.6451. *Could you please let us have a recipe and production method for milk chocolate crumb?* (Denmark.)

A formula for milk chocolate crumb which may be used as a basis for trial is as follows:

Fresh milk	13 gal.
Granulated sugar	32 lb.
Cacao liquor (Neatwork) ...	8 ,,

An evaporating and vacuum drying plant is used to carry out production.

The sugar is dissolved in the fresh milk, and the solution is condensed *in vacuo* to a weight of 56 lb. The resultant mass is mixed with 8 lb. cacao liquor in stirring pans, then placed in shallow trays in vacuum drying ovens, which will reduce the moisture content from 11 to 1 per cent. in 48 hours. The dried mass is chocolate crumb.

Candied Peel

B.6438. *Could you please give us any information on the manufacture of candied peel?* (London.)

The following is the general scheme of the Donachie peel-curing process.

The pipes of peel are drained of brine and the skins thoroughly rinsed with cold water to leach out the salt, the skins being left in cold water overnight. They are cooked the following morning and freshened off as usual.

A syrup of sugar and glucose or invert sugar is prepared, sufficient of the latter being incorporated to prevent graining. The syrup is prepared at 60°F., specific gravity 1·123. This is equivalent to 18° Baumé. The temperature is kept as low as possible to prevent discoloration.

When charging the vacuum pans, the charge of skins and syrup must not be greater than that of the charge of liquid sugar and water which can be boiled in the pan to be used. Sufficient syrup is drawn into the pan to float the charge of skins.

The vacuum is started and the temperature gradually raised to 100°F., the volume of syrup drawn in being carefully noted, and the volume in the pan maintained for six hours. During this time, the strength of the syrup is raised from 18° Baumé to 34° Baumé, *i.e.* specific gravity 1·282. Thus, knowing the original amount of 18° Baumé syrup drawn in at the commencement, and allowing for the water content of the skins, it is a simple matter to determine the number of gallons of 18° Baumé syrup to be drawn in and reduced to raise the strength of the syrup to 34° Baumé. This number divided by six will give the rate per hour for continuous processing.

It is essential to ensure that the syrup is drawn in in a continuous flow, so that the increase in syrup strength shall be steady. The temperature at this stage should not be above 115°F.

When the six hour preparatory stage has been completed, the whole of the 34° Baumé syrup is drawn off, and a syrup of greater strength substituted for the 18° Baumé syrup, according to the amount of sugar required in the final peel.

The Ministry of Food minimum sugar content is 64 per cent., and this is met by the process outlined above.

Walnut Ketchup

B.6456. *Can you supply us with a method of making walnut ketchup?* (London.)

The following recipe is suggested:

Water	10 gal.
Malt vinegar (6 per cent.) ...	90 ,,
Soy sauce	100 lb.
Broken walnuts *ex* brine ...	300 ,,
Brined anchovies	50 ,,
Raw onions	50 ,,
Cloves	1 ,,
Crushed ginger	2 ,,
Mace	¼ ,,
Black pepper	½ ,,
120 gallons out-turn.	

The onions and spices are soaked overnight in 10 gallons of vinegar. The remainder of the vinegar, with the soy, walnuts, and anchovies, is simmered in a pan for one to two hours. The spices and vinegar are then added and simmered very gently for 30 minutes. The sauce is then strained and filtered.

The simmering process should be very gentle in order to minimise losses of acetic acid. Assuming no acid is lost, the above sauce would contain approximately 5 per cent. salt and 4 per cent. acetic acid when finished. If laboratory examination shows that these figures have not been obtained for any reason, salt and/or acetic acid should be added in appropriate amounts until the deficiencies are made good. The best point in the process for such an addition is immediately after straining and before filtering.

It is advisable to fill the sauce hot, although spoilage in a product of such acid and salt content is unlikely. The filtered sauce should be tested for sediment.

Information Supplied

The Enquiry Service has dealt with requests for the names of manufacturers and suppliers of plant, machinery, and materials, and also general information as follows:

B.6416. *Vacuum mixer.* (London.)
B.6417. *Flour filling machine.* (Hunts.)
B.6420. *Waste paper baling press.* (Denmark.)
B.6422. *Dehydrated vegetables.* (London.)
B.6425. *Pickled onions and gherkins.* (Bucks.)
B.6427. *Sugar confectionery.* (Bucks.)
B.6428. *Depositor for biscuits.* (India.)
B.6429. *Foil wrapper for chocolates and heat sealing device.* (Kent.)
B.6430. *German fondant tablet machine.* (Scotland.)
B.6433. *Onions and other vegetables in brine.* (Lincs.)
B.6435. *Hydrolysed protein and powdered onion.* (London.)
B.6436. *Monosodium glutamate.* (Lancs.)
B.6442. *Fruit cleaning equipment.* (Derby.)
B.6443. *Carob juice.* (Lancs.)
B.6446. *Electric smoking machinery.* (Ireland.)
B.6447. *Synthetic cream.* (London.)
B.6449. *Check weighing.* (U.S.A.)
B.6450. *Blackberry juice.* (Ireland.)
B.6453. *Apple peeling by machinery and other methods.* (Lancs.)
B.6454. *Marzipan and macaroon paste..* (Lancs.)
B.6455. *Artificial sweeteners.* (Herts.)
B.6458. *Vacuum packs for foods.* (New Zealand.)

Recent Patents

690,043. SANDALL PRECISION CO., LTD., and BARKER, A. W.: Means for reducing irregularities in the delivery of centre filling apparatus for use in the manufacture of sugar confectionery.

690,054. BRITISH CELLOPHANE, LTD.: Carton and a blank therefor.

690,055. SCRIBBANS-KEMP, LTD., BARSBY, C. R., CHAYTOR, H. C., CLAYTON, W., HENDON, A. L., and SUMNER, C. G.: Manufacture of sponge cake and like materials baked in the form of a continuous web.

690,406. SIMON (HOLDINGS), LTD., H., and LOCKWOOD, J. F.: Cereal purifier machines.

690,506. CLEE AND WEBB, LTD.: Bread cutting machines.

690,510. BAKER PERKINS, LTD.: Dough dividers.

690,525. ROSE BROS. (GAINSBOROUGH), LTD.: Feeding of a continuous rod of toffee or like material to machines for forming individual sweets from the rod.

690,545. TOMELLERI, G.: Apparatus for de-stalking fruits.

690,636. FARRINGDON WORKS AND H. PONTIFEX AND SONS, LTD., and HAMILTON, J. G.: Bottle filling machinery.

690,663. KRAFT FOODS CO.: Manufacture of edible plastic substances.

690,685. SCOTTISH SEAWEED RESEARCH ASSOCIATION, DEWAR, E. T., and BLACK, W. A. P.: Process for the production of laminarin and glucose.

690,700. BRITISH CELANESE, LTD.: Manufacture of cellulose esters.

690,736. ANDREAS, A.: Machines for grinding bulky materials to a colloidal fineness.

690,737. OTTE, W.: Plate-type apparatus for the cooling of liquids such as water, by means of air.

690,740. BARBIER, A. J.: Apparatus for the treatment of liquids.

690,773. VEREINIGTE MAUTNER MARKHOF'SCHE PRESSHEFE FABRIKEN: Leavening agents for the production of bread and pastry and process of manufacturing them.

690,832. MULLIGAN, J., ROWLEY, H., and BARKER, C.: Instrument for use in manipulating food.

690,900. METAL BOX CO., LTD.: Assembly of closure discs for bottles, jars, and the like.

Abstracts of Recent Specifications

Conches for Chocolate Manufacture

Attempts have been made to treat solid chocolate masses in a single conch in order to dry it, but the dry chocolate mass presented such an enormous resistance to the stirring devices, which in certain cases had the form of ploughshares, that in practice the conch was only used for the treatment of liquid chocolate masses.

Moisture, and in particular tannic acid, could not be removed therefrom, and the moisture in the mass resulted in the creation of lumps, requiring the mass to be operated for considerable lengths of time in the conch. Even so, the undesirable acids could not be removed from the mass. In particular, it was quite impossible to treat solid chocolate masses in a double conch.

According to the present invention, a double conch is provided with a pair of stirring devices mounted on vertical spindles which also carry plough blades adapted to displace the chocolate material from one compartment of the double conch to the other and which preferably operate in the same direction as the stirrers.

This construction of stirring device for the double conch machine has the advantage that the solid chocolate mass is thoroughly stirred and worked with the minimum of frictional resistance.

The mass is displaced from one compartment or trough of the conch to the other by the plough blades, and is in constant movement, and yet there is no relative movement within the mass of material. In this manner it is possible to obtain a vigorous and complete aeration of the mass of chocolate in a short space of time, so that a light chocolate mass is established which readily kneads together on the addition of lecithin and cocoa butter, and can readily be stirred into a readily flowing mass.

689,160. *Richard Frisse.*

Oil Recovery from Whales

This relates to a method for recovering (boiling out) oil from whales or other seamammals with the object of preventing the formation during the digestion process of stable oil emulsions which do not yield their oil content during the subsequent clearing process.

As the flesh and blubber of sea mammals upon digestion give an acid residue, the present invention resides in the digestion of bones admixed with such residue. In such mixed charges the emulsification decreased, the *p*H of the residue being lowered to 7·2 to 7·3, and the average remaining oil content decreased to about 5 per cent.

By adding varying quantities of such acid residue obtained from the oil separator upon digestion of flesh or blubber, prior to or during the digestion, it is found possible to effect digestion of bones in an acid medium without appreciable emulsification so that a residue with a fat content below 1 per cent. is produced. As such acid residue from the digestion of flesh or blubber ordinarily is a waste product presented in practically unlimited quantities and usually blown overboard, additional profits are realised.

685,122. *Eilif Fredrik Heyerdahl.*

Treatment of Grain in Silos

According to this invention, air preheated to a temperature which will not damage the grain is first blown through the grain which is stored in the silo, by means of the usual ventilation equipment, whereby the grain is heated in a comparatively short time and with partial drying to approximately the temperature of the heated air, and then the air heating means is shut off and air at normal temperature is blown in, whereby on account of the large temperature difference a further drying of the grain takes place with simultaneous cooling to the temperature of the ingoing air.

Preferably air is blown in at 30° to 40°C., so that the grain is heated rapidly. On account of the low relative humidity of the air, a part of the moisture is extracted from the grain, and there is no danger of mould formation in the short time required for the heating.

Then the air preheater is shut off, and the same ventilating appliances are used to blow in cool air at, say, 10° to 15°C. The air becomes heated by the grain and its relative humidity is thereby reduced so that it is able to extract further moisture from the grain, the drying effect being greater than in the usual cold air ventilating method owing to the greater temperature difference. In addition the grain is gradually cooled down to practically the temperature of the air.

As a result of this treatment the moisture content of the grain is reduced to a value at which it can be stored for extended periods or kept in good condition by normal cold air ventilation.

688,900. *Henry Simon (Holdings) Ltd.*

Concentrated Milk Products

This invention relates to processes for the preparation of inoculating materials for concentrated milk products and for making the lactose in concentrated milk products crystallise in a very fine state.

The process is characterised in that a powder comprising a water-soluble organic compound of high molecular weight and lactose in the crystallised state is pulverised in a concentrated milk product not yet containing any crystallised lactose.

Suitable proportions of the lactose-containing powder and the concentrated milk product in which it is pulverised are, for example, one kilogram of the former to 10 kilograms of the latter, and the quantity of inoculating material thus produced would be sufficient for the treatment of a much larger amount, for instance, over 200 kilograms, of concentrated milk product than that employed in the production of the inoculating material.

683,007. *De Coöperatieve Fabriek van Melkproducten te Bedum.*

Wrapping Machines

This invention relates to a machine for wrapping loose biscuits, or other thin articles of similar shape, and has for its object to provide a machine which is readily adjustable so that it may deal with biscuits of different shapes and sizes, and with packages accommodating different numbers of biscuits.

The machine comprises an intermittently rotating wrapping wheel mounted to turn on a horizontal axis and having a number of pockets which move in succession from a loading station to a discharge station.

The machine has three fixed datum points, *viz.* the position in relation to the conveyor of each pusher, the position occupied at the loading station by the fixed jaw of each pocket of the wrapping wheel and the position of the horizontal discharge platform. Changes in the machine to suit variations in size and shape of the wrapped package are all effected by interchange or adjustment of other parts of the conveyor, of the elevator, of the wrapping wheel, of the wrapper feed mechanism, and of folding devices which co-operate with the wrapping wheel and with the discharge platform to complete the folding of the wrapper around each stack of biscuits.

684,252. *The Forgrove Machinery Company Limited and Alexander Russell.*

Recent patents and trade marks have been selected from the "Official Journal of Patents" and the "Official Trade Marks Journal" and are published by permission of the Controller of H.M.S.O.

Trade Marks

HAMETTA.—702,586. Tinned ham; and tinned food products consisting principally of ham. **Henry George William Hosking,** 4, Woodcote Hall, Wallington, Surrey; Manufacturer and Merchant.

CREMALLOW.—704,564. Marshmallow for use in the baking and confectionery trades. **British Fondants, Limited,** Avern Works, Avern Road, East Molesey, Surrey; Manufacturers and Merchants.

DULCET.—707,876. Non-medicated confectionery. **London and Continental Export Company, Limited,** also trading as **Dulcet Confectionery,** 29, Mincing Lane, London, E.C.3, and North Acton Road, London, N.W.10; Manufacturers.

PIK-A-PAK.—709,075. Nuts (fruits). **H. S. Whiteside and Company, Limited,** Parkhouse Works, Parkhouse Street, Camberwell, London, S.E.5; Manufacturers.

BIX.—709,726. Salted biscuits, not being for animals. **Co-operative Wholesale Society, Limited,** 1, Balloon Street, Manchester; Wholesale Dealers and Manufacturers.

PLUTO.—711,093. Liquorice being non-medicated confectionery. **Patent Phosphates and Merchandise, Limited,** 323-327, Corn Exchange, Manchester, 4; Merchants.

LONE STAR RIDER.—711,224. Preparations made from cereals for food for human consumption. **Die Casting Machine Tools, Limited,** River Works, 152, Green Lanes, London, N.13; Manufacturers.

VINROSS.—711,760. Condiments (other than condiments for cattle). **James Ross and Son (Newcastle), Limited,** Cambridge Preserving Works, Gloucester Street, Newcastle-upon-Tyne, 4; Manufacturers.

HONIBEAR.—711,924. Ice cream, water ices, and frozen confectionery. **Arcadia Caterers, Limited,** Lansdowne House, Hastings Road, Swadlincote, Burton-on-Trent, Derbyshire; Manufacturers.

DOLALOLLI.—711,927. Ice cream, water ices, and frozen confectionery. **Arcadia Caterers, Limited,** Lansdowne House, Hastings Road, Swadlincote, Burton-on-Trent, Derbyshire; Manufacturers.

JET.—711,947. Water ices. **R. Marcantonio, Limited,** 6, Lansdowne Hill, West Norwood, London, S.E.27; Ice Cream Manufacturers.

DELTA.—711,955. Tea. **Henderson and Liddell, Limited,** also trading as **Ginner, Morton and Goddard,** 10 and 15, Eastcheap, London, E.C.3; Merchants.

PLAIN SAILIN'.—712,028. Biscuits (other than biscuits for animals). **Excelsior Biscuit Company, Limited,** 50, Thomas Road, London, E.14; Manufacturers and Merchants.

JESTER.—712,034. Biscuits (other than biscuits for animals). **Excelsior Biscuit Company, Limited,** 50, Thomas Road, London, E.14; Manufacturers and Merchants.

SPRINGBOK.—712,109. Aerating powders for use in baking. **Albright and Wilson, Limited,** 49, Park Lane, London, W.1; Manufacturers.

ROSALIND.—712,353. Tea, flour, and cereals prepared for human consumption. **Angel Warehouse Company, Limited,** 74, Upper Street, Islington, London, N.1; Manufacturers and Merchants.

BONDS.—712,430. Chocolate confectionery (not medicated). **Charles Bond, Limited,** Carlyle Road, Bristol, 5; Manufacturers.

OH HENRY.—712,492. Candy (not medicated). **Williamson Candy Company** (a Corporation organised under the laws of the State of Illinois, United States of America), 4701, Armitage Avenue, Chicago, Illinois, United States of America; Manufacturers.

CHELVEAT.—712,557. Flour milling products prepared for food for human consumption. **Chelsea Food Products, Limited,** 15, Lots Road, London, S.W.10; Flour Millers.

VITALOL.—712,605. Lollipops being ice confectionery. **Lautier Fils, Limited,** Power Road, Chiswick, London, W.4; Merchants and Manufacturers.

ENNIS VALE.—712,621. Milk products. **The Primrose Dairy (Cornwall), Limited,** St. Erth Creamery, Hayle, Cornwall; Manufacturers.

WINGED WHEEL.—712,803. Fish (except live fish). **Wilbur, Ellis Company (Pty.), Limited** (a Joint Stock Company organised under the laws of the Union of South Africa), 813, Grand Parade Centre, Cape Town, Union of South Africa; Canners and Merchants.

MULSAMIX.—712,892. Food mixing machines and parts and fittings thereof. **Peerless and Ericsson, Limited,** and **The Peerless Electrical Manufacturing Company, Limited,** trading in co-partnership as **Peerless and Ericsson,** 6, Lygon Place, Grosvenor Gardens, London, S.W.1; Manufacturers.

New Companies

Arrow Replacement Service, Limited. (515162.) Insurance Buildings, Neal Street, Cardiff. To provide a service for the hire and general supply and replacement of clean overalls, smocks, blouses, coats, and protective garments, etc. Nom. cap.: £10,000 in 4,000 ord. shares of £1 and 1,200 cum. pref. shares of £5 each. Dirs.: to be appointed by subs. Subs.: A. H. Barry, Velindre, Heol Isaf, Radyr, Glam. (co. dir.); Kathleen M. Jones, 71, Rhydypenau Road, Cyncoed, Cardiff (co. secy.).

Winton Confectionery Company, Limited. (515318.) 11, Hankinson Road, Winton, Bournemouth. Nom. cap.: £2,000 in £1 shares. Dirs.: not named. Subs.: J. A. Mobey and S. C. McCree, 11, Hankinson Road, Winton, Bournemouth.

Linerboard Servicing, Limited. (515312.) Swinton House, 324, Grays Inn Road, London, W.C.1. To carry on business of shipping and forwarding agents, manufacturers of and dealers in board, paper, and pulp of all kinds, including Kraft lines and corrugating material, etc. Nom. cap.: £3,000 in £1 shares. Dirs.: Grace L. L. Hacker, 81, Cornwallis Avenue, Tonbridge, Kent, and G. W. Cole, 5, Vale Cottages, Kingston Vale, London, S.W.15.

Theatre Candies, Limited. (515394.) 397, Mile End Road, Stepney, London, E.3. To carry on business of manufacturers of and dealers in chocolates, boiled and other sweets, etc. Nom. cap.: £100 in £1 shares. Dirs.: to be appointed by subs. Subs.: L. Diamond, 13, Crescent Road, London, N.8 (clk.), and N. Ludbrook, 31a, Gunterstone Road, London, W.14 (cashier).

Warrell's Wholesale (Bury St. Edmunds), Limited. (515397.) 23, Angel Hill, Bury St. Edmunds, Suffolk. To carry on business of manufacturers of and dealers in chocolates, sweets, confectioneries, chewing gum, tea, cocoa, coffee, foods, and refreshments of all kinds, etc. Nom. cap.: £100 in £1 shares. Dirs.: R. L. Warrell, Edith K. Warrell, and J. R. Warrell, all of The Fort, Southgate Green, Bury St. Edmunds.

Harvest Teas, Limited. (515442.) 232/8, Bishopsgate, London, E.C.2. To carry on business of growers and producers, importers and exporters of, and dealers in tea, coffee, cocoa, and greengroceries; restaurateurs, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: A. Lucas and Mrs. H. Lucas, 68, Rokesly Avenue, Crouch End, London, N.8, and J. Powell, 1, Clareville Grove, Kensington, London, S.W.7 (solr.).

Abattoir Managers (Canterbury), Limited. (515494.) 34a, High Street, Ashford, Kent. To carry on business of licensed cattle slaughterers, and to establish, maintain, operate, and manage abattoirs, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: H. J. Buckworth, The Firs, Whitstable Road, Blean, nr. Canterbury, and P. L. Wood, Homewood Hall, Sturry, Kent.

Plastic Box Company, Limited. (515512.) King Street, Market Rasen, Lincs. Nom. cap.: £5,000 in £1 shares. Dirs.: Mrs. O. M. E. Trill, Brattleby, Lincoln, and Mrs. E. Upton, 22, Lindum Road, Lincoln.

Alfred Wide and Company, Limited. (515518.) To take over business of egg, poultry, and rabbit merchants carried on as "Alfred Wide and Co." at Hemyock, Holsworthy, and Morchard Road, all in Devon, and Chard, Somerset. Nom. cap.: £20,000 in £1 shares (10,000 cum. pref.). Dirs.: to be appointed by subs. Subs.: H. L. Wide, Orpington House, Hemyock, Devon, and G. H. Gould, 63, Westbourne Terrace, London, W.2 (solr.).

Cotswold Cake Company, Limited. (515536.) 105, Promenade, Cheltenham. Nom. cap.: £5,000 in £1 shares. Permt. dirs.: W. R. Turnbull and Margaret E. Turnbull, Lambourn House, Libertus Road, Cheltenham.

Select Confectionery Company (Wholesale), Limited. (515628.) Nom. cap.: £3,000 in £1 shares. Permt. dirs.: C. F. Jones, 65, Welford Road, Shirley, Birmingham; May Flint, 1067, Yardley Wood Road, Kings Norton, Birmingham; and G. A. Onley, address not stated.

Advance Progress, Limited. (515637.) 25, Ollerbarrow Road, Hale, Cheshire. To carry on business of importers and distributors of raw materials and food commodities of all kinds, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: P. M. Evans, 25, Ollerbarrow Road, Hale, Cheshire; W. Hall, 890, Liverpool Road, Woodvale, Southport; and R. N. Larsen, 29, Rutland Avenue, Firswood, Manchester, 16.

H.W.P. (Food Products), Limited. (515719.) 410, Station Road, Westcliff-on-Sea. To carry on business of general produce merchants, etc. Nom. cap.: £2,000 in 2s. shares (12,000 red. pref., 1,000 def., and 7,000 ord.). Dirs.: to be appointed by subs. Subs.: W. G. Curtis and Mona E. Curtis, 78, Parkanaur Avenue, Thorpe Bay, Essex.

Ashton Wills (Filter Materials), Limited. (515741.) Central Bank Chambers, Infirmary Street, Leeds. To carry on business of manufacturers of and dealers in industrial filters and water softeners, etc. Nom. cap.: £2,000 in £1 shares. Permt. dirs.: W. R. Wills, 6, Caxton Road, Sheffield, 10, and Mrs. V. M. Bagshaw, Marshcot, Castleton Road, Hope, *via* Sheffield.

From Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C.2.